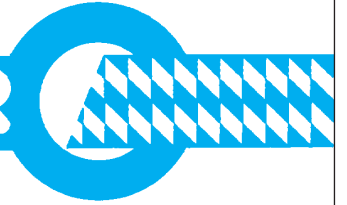


HUNGER



Version 3.1

Catalog M23 Marine Range

Equipment for Maintenance and Repair of Large Diesel and Gas Engines

Ludwig Hunger Werkzeug- und Maschinenfabrik GmbH

Postal Address
PO Box 70 09 60
81309 Munich
Germany

Street Address
Graefelfinger Str. 146
81375 Munich
Germany

Contact and Information
Tel +49 89 7091 25
sales@ludwig-hunger.de
www.ludwig-hunger.de

Experience Performance Quality

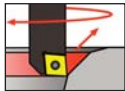
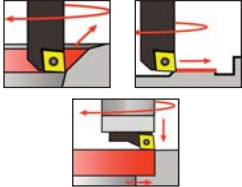
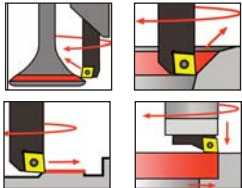
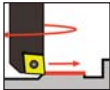
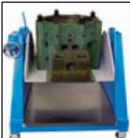
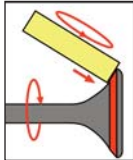
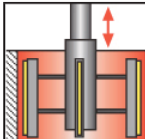


HUNGER - a company with experience - specializing in the manufacture of precision tools and valve service equipment for many years - and with the most comprehensive range of valve service equipment.

Years ago, **HUNGER** pioneered precision valve and valve seat refacing systems which have been further developed and refined until we have the present high performance equipment.

The qualities of **HUNGER** equipment are derived from working in very close cooperation with leading engine manufacturers and the research and experience gained by **HUNGER** in over 100 years of precision equipment manufacture.

HUNGER equipment has been tested and approved by leading engine manufacturers and is being used for high performance work throughout the world. Today's exacting tolerances and finishes call for **HUNGER** equipment.

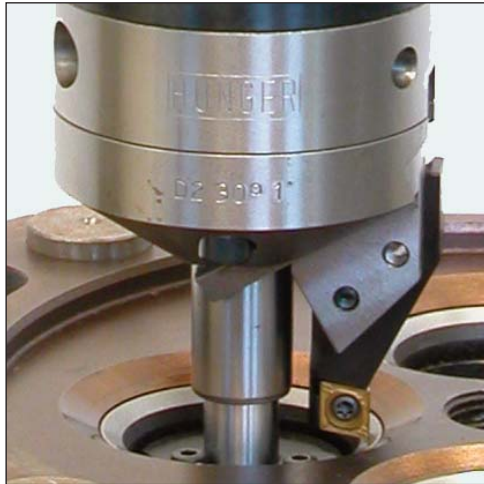
You can rely on **HUNGER**.

		Page
	Refacing Valve Seats VDS2E Refacing Machine for seats from 35 to 90 mm diam. VDS2.3E Refacing Machine for seats from 35 to 110 mm diam. VDS2.5HD Refacing Machine for seats from 35 to 140 mm diam.	4 - 6 7 - 9 10 - 12
	Refacing Valve Seats, Face Turning & Counterboring VD4HD for refacing valve seats from 60 to 230 mm diam. resurfacing sealing surfaces from 75 to 500 mm diam. and counterboring seat ring pockets from 66 to 225 mm diam.	13 - 16
	Refacing Valves & Valve Seats, Face Turning & Counterboring UDM4E for refacing valves with stem diam. from 18 to 40 mm refacing valve seats from 60 to 230 mm diam face turning sealing surfaces from 75 to 500 mm diam. and counterboring seat ring pockets from 66 to 225 mm diam.	17 - 20
	Face Turning RCM Machine for face turning sealing surfaces up to 720 mm diam.	21 - 22
	WV Cylinder Head Stand for ease of cylinder head work	23
	Grinding Valves VKM1M Grinding Machine for valves with stem diam. up to 20 mm VKM2.3M Grinding Machine for valves with stem diam. up to 32,5 mm VKM3.1 Grinding Machine for valves with stem diam. up to 32,5 mm VKM3.4 Grinding Machine for valves with stem diam. up to 40 mm VKM4A Grinding Machine for valves with stem diam. up to 40 mm SG175 Support Grinder for use on a lathe	25 26 - 27 28 - 29 30 - 31 32 - 33 35
	Honing Cylinder Liners PHM Mobile Machines for Honing up to 640 mm diam. HMB Honing Rigs for the PHM Honing Machines	36 38
	Testing Fuel Injectors NTS Fuel Injector Test Stand	39
	High Pressure Hydraulic Power Packs HD1500 Hydraulic Power Pack for pressure up to 1500 bar HD2500 Hydraulic Power Pack for pressure up to 2500 bar HD3000 Hydraulic Power Pack for pressure up to 3000 bar	39 40 41

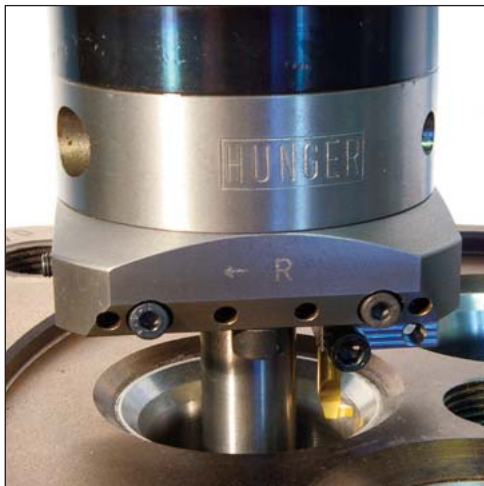
Valve Seat Refacing Machine for Valve Seat Diameter Range 35 - 90 mm



- Compact and handy design.
- Powered by safety extra low voltage to avoid risk of electrical hazard.
- Easy to use
- Fast set-up time.
- No abrasive dust.
- A fast clean cut.
- A precise seat angle time and again.
- Tested and specified by leading engine manufacturers.



Refacing Head Type D2/xx°



Groove Cutting Head Type D2/S0

HANDLING

Setup is fast and easy.

First, insert the pilot fitted with the supporting spider into the valve guide.

Then, place the machine on the pilot and position the cutting tool in front of the inner edge of the valve seat .

Select the depth of cut by tuning micrometer downfeed.

One graduation of the downfeed scale correspond to 0,025 mm downfeed.

Connect the the output cable of the separate power supply unit to the machine and the input cable to the mains.

Refacing is automatic.

Pressing one button is enough to start the refacing pass.

Two or three passes will restore the valve seat to the original condition.

WORKING PRINCIPLE

The valve seat is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

While the cutting insert rotates in a circle around the valve seat, a feed gear mechanism ensures a continuous outward transverse feed motion under the proper seat angle.

This angle is defined by an inclined slideway provided for the tool slide in the seat refacing head.

The seat refacing head with the built-in slideway for cutting tool travel is exchangeable mounted to the feed gear unit to ensure a precise seat angle eliminating faulty setting operations.

The VDS2E is aligned and guided by a pilot which is inserted in the valve guide bore and stabilized by a supporting spider just below the valve seat.

The lathe-type refacing action provides a flawless concentric seating surface texture for a perfect valve seal.

Roundness, concentricity and surface finish of the refaced valve seat are within manufacturers' specifications or even better.

SPECIAL FEATURES

The machine is fitted with two drive motors resulting in a smooth cutting action.

Powered by SELV (Safety Extra Low Voltage) to avoid risk of electrical hazard.

In addition to the valve seat refacing heads for the popular valve seat angles, a face turning head is available for machining the top surface of the valve seat ring.

A groove cutting head is available for cutting a groove into the valve seat ring so that the hook elements of the seat ring puller can grip the valve seat ring to remove the valve seat ring from the cylinder head.

SPECIFICATIONS

Capacities

Seat diameter range 35 - 90 mm
 Seat angle range 0° - 45°

Cutting motions

Rotation Speed 270 and 360 rpm
 Cross Feed per Revolution 0,05 mm

Electrics

Operating voltage max. 42 VDC
 Power Supply
 Input voltage: 230±10% VAC
 or 120±10% VAC
 or 277±10% VAC
 (1ph.50/60Hz)
 Power input 0,3 kW

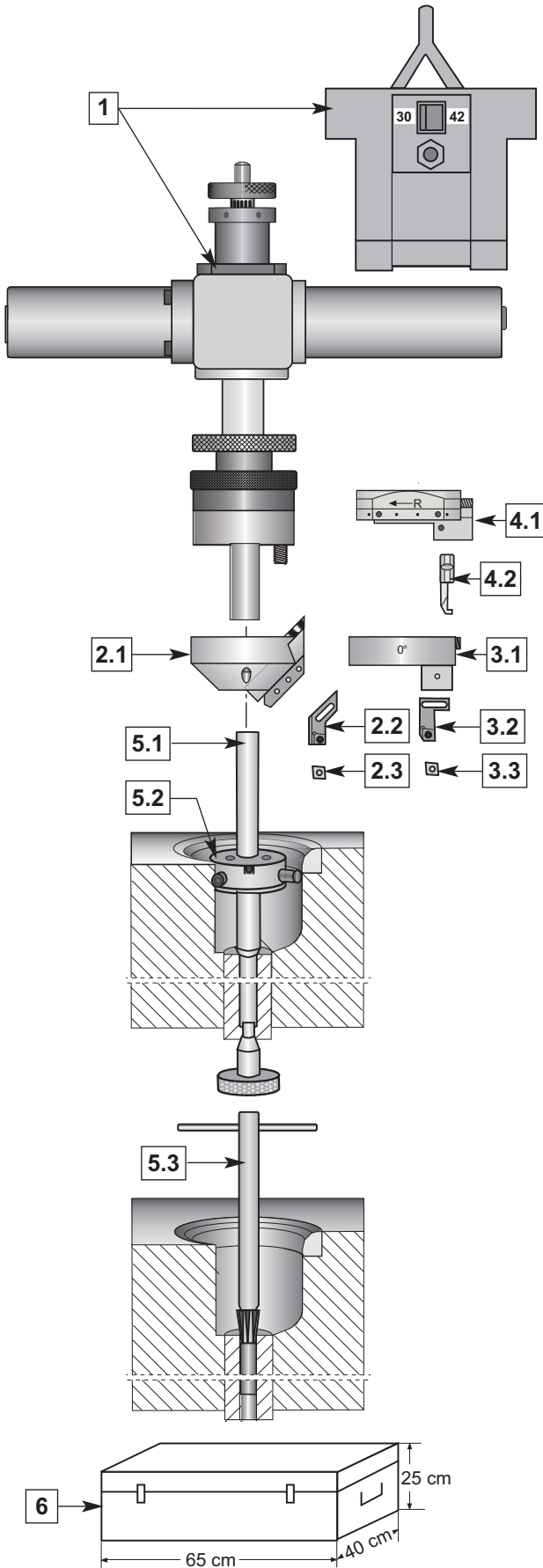
Dimensions of the machine

Length 410 mm
 Width 125 mm
 Height 340 mm

Weight of the machine

Net weight approx. 7,5 kg

The Modular Components

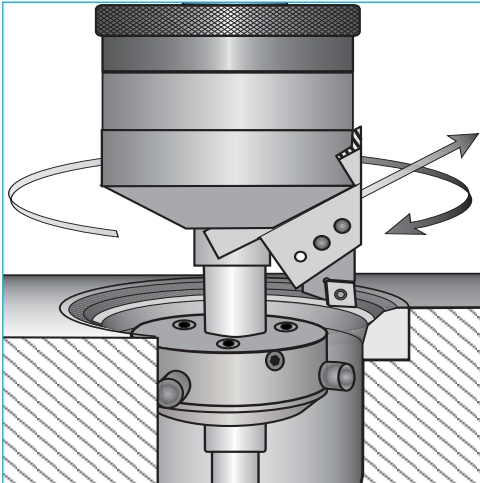


Item	Description	P/N
1.	VDS2E Basic Machine including Power Supply Unit wired for single-phase input voltage 230V, optional also 120V & 277V	247 05 200
2.	<u>Accessories for refacing valve seats</u>	
2.1	Valve Seat Refacing Heads	
2.1.1	D2/45° Seat Refacing Head for 45° seats	247 11 245
2.1.2	D2/35° Seat Refacing Head for 35° seats	247 14 235
2.1.3	D2/30° Seat Refacing Head for 30° seats	247 12 230
2.1.4	D2/25° Seat Refacing Head for 25° seats	247 15 225
2.1.5	D2/20° Seat Refacing Head for 20° seats	247 17 220
2.1.6	D2/15° Seat Refacing Head for 15° seats	247 13 215
2.2	Insert Holders for Refacing Valve Seats	
2.2.1	SD00 Insert Holder for seat diam. 35-60 mm	247 65 108
2.2.2	SC01 Insert Holder for seat diam. 40-75 mm	247 65 103
2.2.3	SC02 Insert Holder for seat diam. 70-90 mm	247 65 104
2.3	Cutting Inserts for Refacing Valve Seats	
2.3.1	Insert Type C0604CB for SD00 Holder Application: General purpose	862 20 021
2.3.2	Insert Type C0602HB for SD00 Holder Application: Very hard seats	862 20 016
2.3.3	Insert Type C0908CU for SC01/02 Holder Application: General purpose	862 20 007
2.3.4	Insert Type C0908HU for SC01/02 Holder Application: Super alloys	862 20 009
2.3.5	Insert Type C0904CB for SC01/02 Holder Application: Hard seats	862 20 010
2.3.6	Insert Type C0904HB for SC01/02 Holder Application: Cr & Ni alloys	862 20 013
2.3.7	Insert Type C0904HU for SC01/02 Holder Application: Very hard seats	862 20 015
2.3.8	Insert Type C0904CBN for SC01/02 Holder Application: Extremely hard seats	862 20 022
3.	<u>Accessories for face turning</u>	
3.1	D2/0° Face Turning Head for diam. 48-90 mm	247 19 200
3.2	Insert Holders for face turning	
3.2.1	SC1-0° Insert Holder for diam. range 48-65 mm	247 65 111
3.2.2	SC2-0° Insert Holder for diam. range 65-90 mm	247 65 119
3.3	Cutting Inserts for Face Turning	
3.3	Insert C0904CB for cast iron	862 20 010
4.	<u>Accessories for cutting grooves</u>	
4.1	D2/S0 Groove Cutting Head	247 20 200
4.2	Gooving tools	
4.2.1	Grooving Tool Type 6/2 for diam. range 48-75 mm	862 25 154
4.2.2	Grooving Tool Type 8/2 for diam. range 75-90 mm	862 25 156
5.	<u>Accessories for aligning and guiding the VDS2E</u>	
5.1	Pilots tailored to the respective engine models	on request
5.1.1	UP2 Universal Pilot Kit for valve guide diameter range 16-27 mm	247 70 100
5.2	Supporting Spiders for supporting pilot shaft just below the valve seat	on request
5.3	Chamfering Tools for cleaning the valve guide bore	on request
6.	Storage Case	247 90 038

Valve Seat Refacing Machine for Valve Seat Diameter Range 35 - 110 mm



- Compact and handy design.
- Powered by safety extra low voltage to avoid risk of electrical hazard.
- Easy to use
- Fast set-up time.
- No abrasive dust.
- A fast clean cut.
- A precise seat angle time and again.
- Tested and specified by leading engine manufacturers.



Working Principle



Seat Refacing Head Type D3/xx

HANDLING

Setup is fast and easy.

First, insert the pilot fitted with the supporting spider into the valve guide.

Then, place the machine on the pilot and position the cutting tool in front of the inner edge of the valve seat.

Select the depth of cut by tuning micrometer downfeed.

One graduation of the downfeed scale correspond to 0,025 mm downfeed.

Connect the the output cable of the separate power supply unit to the machine and the input cable to the mains.

Refacing is automatic.

Pressing one button is enough to start the refacing pass.

Two or three passes will restore the valve seat to the original condition.

WORKING PRINCIPLE

The valve seat is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

While the cutting insert rotates in a circle around the valve seat, a feed gear mechanism ensures a continuous outward transverse feed motion under the proper seat angle.

This angle is defined by an inclined slideway provided for the tool slide in the seat refacing head.

The seat refacing head with the built-in slideway for cutting tool travel is exchangeable mounted to the feed gear unit to ensure a precise seat angle eliminating faulty setting operations.

The VDS2.3E is aligned and guided by a pilot which is locked in the valve guide bore and stabilized by a supporting spider just below the valve seat.

The lathe-type refacing action provides a flawless concentric seating surface texture for a perfect valve seal.

Roundness, concentricity and surface finish of the refaced valve seat are within manufacturers' specifications or even better.

SPECIAL FEATURES

The machine is fitted with two drive motors resulting in a smooth cutting action.

Powered by SELV (Safety Extra Low Voltage) to avoid risk of electrical hazard.

A face turning head is available in addition to the valve seat facing heads to resurface the flat area around the valve seat.

SPECIFICATIONS

Capacities

Seat diameter range	35 - 110 mm
Seat angle range	0° - 45°

Machining motions

Rotation Speed	270 and 360 rpm
Cross Feed per Revolution	0,05 mm

Electrics

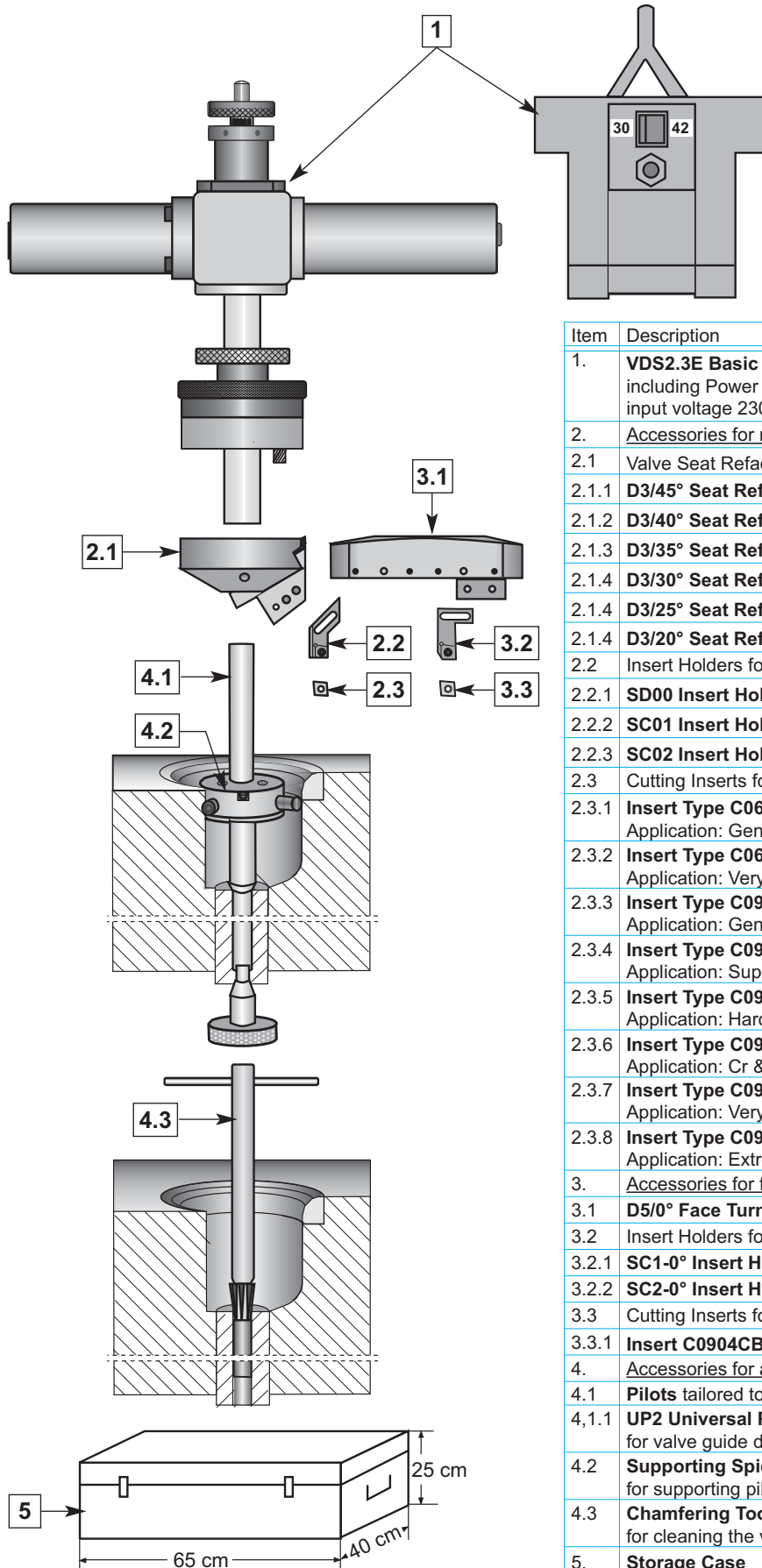
Operating voltage	max. 42 VDC
Power Supply	
Input voltage:	230±10% VAC
(1ph.50/60Hz)	or 120±10% VAC
	or 277±10% VAC
Power input	0,3 kW

Dimensions of the machine

Length	410 mm
Width	125 mm
Height	360 mm

Weight of the machine

Net weight	approx. 9,5 kg
------------	----------------

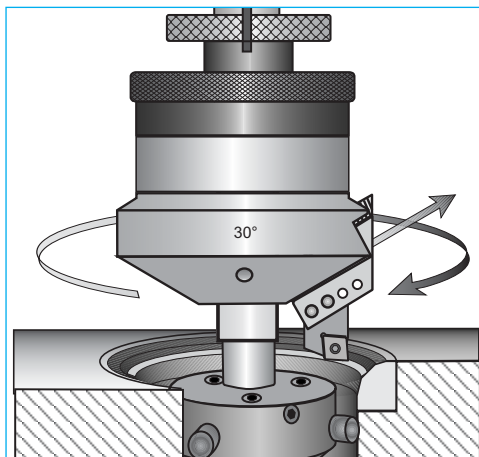
The Modular Components


Item	Description	P/N
1.	VDS2.3E Basic Machine including Power Supply Unit wired for single-phase input voltage 230V, optional also 120V & 277V	247 05 300
2.	<u>Accessories for refacing valve seats</u>	
2.1	Valve Seat Refacing Heads	
2.1.1	D3/45° Seat Refacing Head for 45° seats	247 11 345
2.1.2	D3/40° Seat Refacing Head for 40° seats	247 16 340
2.1.3	D3/35° Seat Refacing Head for 35° seats	247 14 335
2.1.4	D3/30° Seat Refacing Head for 30° seats	247 12 330
2.1.4	D3/25° Seat Refacing Head for 25° seats	247 15 325
2.1.4	D3/20° Seat Refacing Head for 20° seats	247 17 320
2.2	Insert Holders for Refacing Valve Seats	
2.2.1	SD00 Insert Holder for seat diam. 60-60 mm	247 65 108
2.2.2	SC01 Insert Holder for seat diam. 46-120 mm	247 65 103
2.2.3	SC02 Insert Holder for seat diam. 65-120 mm	247 65 104
2.3	Cutting Inserts for Refacing Valve Seats	
2.3.1	Insert Type C0604CB for SD00 Holder Application: General purpose	862 20 021
2.3.2	Insert Type C0602HB for SD00 Holder Application: Very hard seats	862 20 016
2.3.3	Insert Type C0908CU for SC01/02 Holder Application: General purpose	862 20 007
2.3.4	Insert Type C0908HU for SC01/02 Holder Application: Super alloys	862 20 009
2.3.5	Insert Type C0904CB for SC01/02 Holder Application: Hard seats	862 20 010
2.3.6	Insert Type C0904HB for SC01/02 Holder Application: Cr & Ni alloys	862 20 013
2.3.7	Insert Type C0904HU for SC01/02 Holder Application: Very hard seats	862 20 015
2.3.8	Insert Type C0904CBN for SC01/02 Holder Application: Extremely hard seats	862 20 022
3.	<u>Accessories for face turning</u>	
3.1	D5/0° Face Turning Head for diam. 46-140mm	247 19 500
3.2	Insert Holders for face turning	
3.2.1	SC1-0° Insert Holder for diam. range 35-60 mm	247 65 111
3.2.2	SC2-0° Insert Holder for diam. range 46-120 mm	247 65 119
3.3	Cutting Inserts for Face Turning	
3.3.1	Insert C0904CB for cast iron	862 20 010
4.	<u>Accessories for aligning and guiding the VDS3.3E</u>	
4.1	Pilots tailored to the respective engine models	on request
4.1.1	UP2 Universal Pilot Kit for valve guide diameter range 16-27 mm	247 70 100
4.2	Supporting Spiders for supporting pilot shaft just below the valve seat	on request
4.3	Chamfering Tools for cleaning the valve guide bore	on request
5.	Storage Case	247 90 038

Valve Seat Refacing Machine for Valve Seat Diameter Range 35 - 140 mm



- Compact and handy design.
- Powered by safety extra low voltage to avoid risk of electrical hazard.
- Easy to use
- Fast set-up time.
- No abrasive dust.
- A fast clean cut.
- A precise seat angle time and again.
- Tested and specified by leading engine manufacturers.



Working Principle



Exchangeable Refacing Head

HANDLING

Setup is fast and easy.

First, insert the pilot fitted with the supporting spider into the valve guide.

Then, place the machine on the pilot and position the cutting tool in front of the inner edge of the valve seat .

Select the depth of cut by tuning micrometer downfeed.

One graduation of the downfeed scale correspond to 0,025 mm downfeed.

Connect the the output cable of the separate power supply unit to the machine and the input cable to the mains.

Refacing is automatic.

Pressing one button is enough to start the refacing pass.

Two or three passes will restore the valve seat to the original condition.

WORKING PRINCIPLE

The valve seat is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

While the cutting insert rotates in a circle around the valve seat, a feed gear mechanism ensures a continuous outward transverse feed motion under the proper seat angle.

This angle is defined by an inclined slideway provided for the tool slide in the seat refacing head.

The seat refacing head with the built-in slideway for cutting tool travel is exchangeable mounted to the feed gear unit to ensure a precise seat angle eliminating faulty setting operations.

The VDS2.5HD is aligned and guided by a pilot which is locked in the valve guide bore and stabilized by a supporting spider just below the valve seat.

The lathe-type refacing action provides a flawless concentric seating surface texture for a perfect valve seal.

Roundness, concentricity and surface finish of the refaced valve seat are within manufacturers' specifications or even better.

SPECIAL FEATURES

The machine is fitted with two drive motors resulting in a smooth cutting action.

Powered by SELV (Safety Extra Low Voltage) to avoid risk of electric hazard.

The SELV is supplied by an universal power supply unit featuring a wide input range of 100 to 300 VAC.

The rotary speed of the refacing head is adjustable so that the speed can be selected according to the diameter and hardness of the valve seat.

SPECIFICATIONS

Capacity

Seat diameter range 35 - 140 mm
Seat angle range 0° - 45°

Cutting motions

Rotary speed range 190 - 360 rpm
Transverse feed rate 0,05 mm/rev.

Electrics

Operating voltage of machine max. 27 VDC
Universal Power Supply Unit
Supply voltage range 100 - 300 VAC
(1ph. 50/60Hz)
Power Requirement 0,3 kW

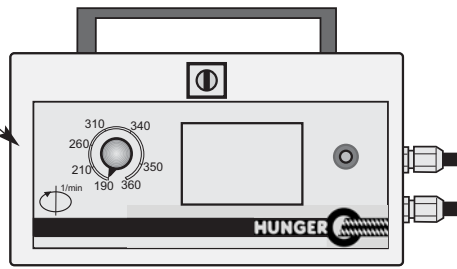
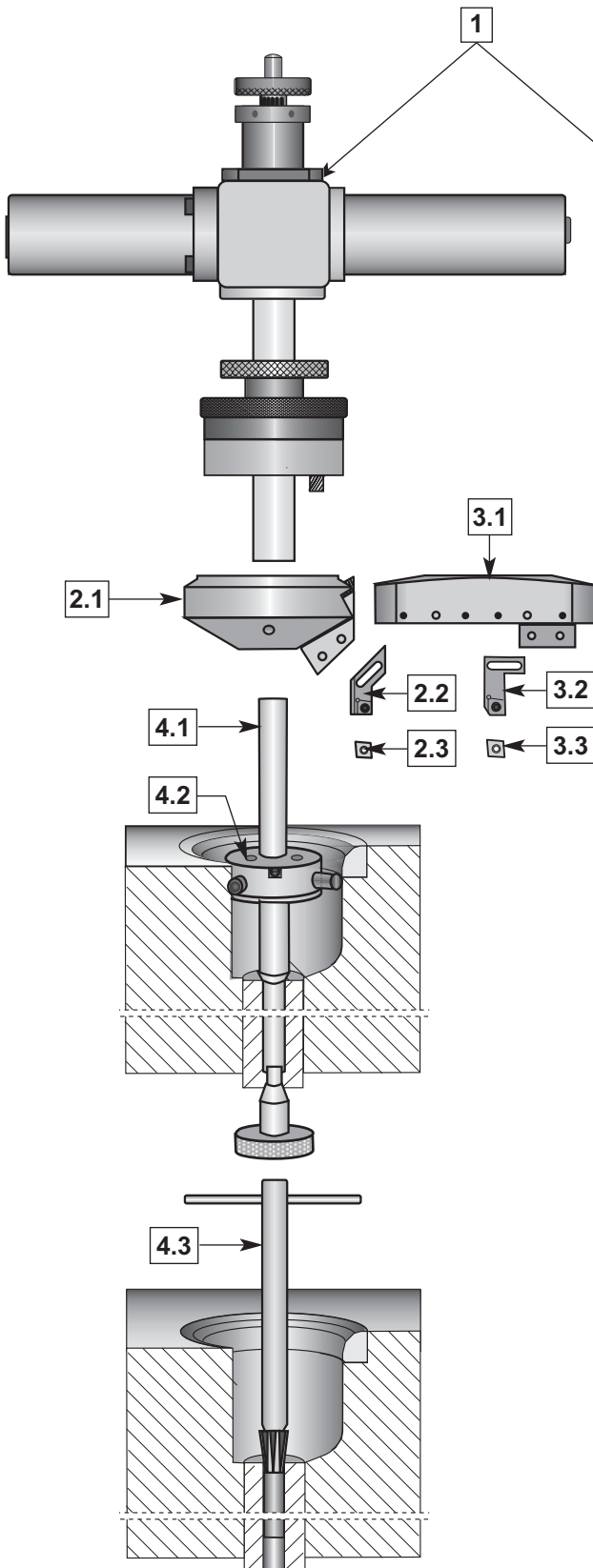
Dimensions of the machine

Length 410 mm
Width 125 mm
Height 310 mm

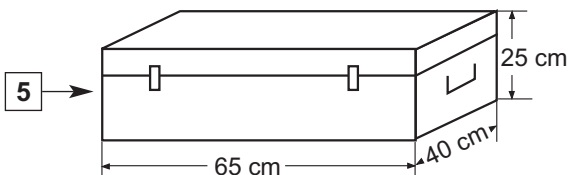
Weight of the machine

Net weight approx. 10 kg

The Modular Components



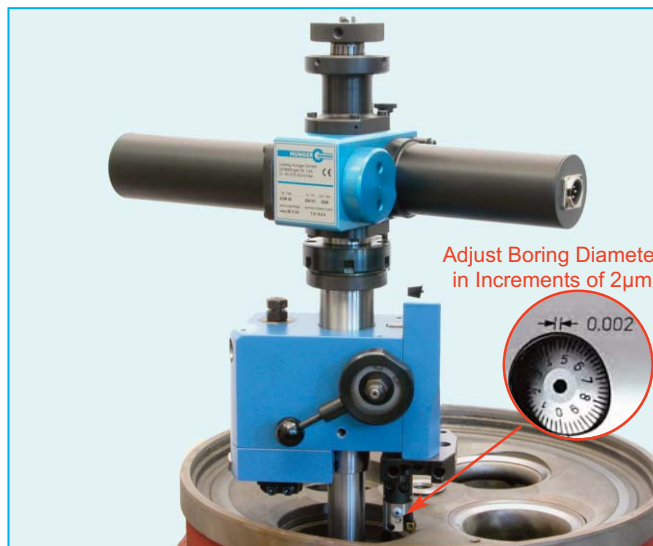
Item	Description	P/N
1.	VDS2.5HD Basic Machine including Universal Power Supply Unit wired for input voltage range 100 - 300 VAC	247 05 500
2.	<u>Accessories for refacing valve seats</u>	
2.1	Valve Seat Refacing Heads Angle Diam.Range	
2.1.1	D5/45° Seat Refacing Head 45° 35-140 mm	247 11 545
2.1.2	D5/40° Seat Refacing Head 40° 35-140 mm	247 16 540
2.1.3	D5/30° Seat Refacing Head 30° 35-140 mm	247 12 530
2.1.4	D5/20° Seat Refacing Head 20° 35-140 mm	247 17 520
2.1.5	D3/35° Seat Refacing Head 35° 35-120 mm	247 14 335
2.1.6	D3/25° Seat Refacing Head 25° 35-120 mm	247 15 325
2.2	Insert Holders for Refacing Valve Seats	
2.2.1	SD00 Insert Holder for seat diam. 60-60 mm	247 65 108
2.2.2	SC01 Insert Holder for seat diam. 46-120 mm	247 65 103
2.2.3	SC02 Insert Holder for seat diam. 65-140 mm	247 65 104
2.3	Cutting Inserts for Refacing Valve Seats	
2.3.1	Insert Type C0604CB for SD00 Holder Application: General purpose	862 20 021
2.3.2	Insert Type C0602HB for SD00 Holder Application: Very hard seats	862 20 016
2.3.3	Insert Type C0908CU for SC01/02 Holder Application: General purpose	862 20 007
2.3.4	Insert Type C0908HU for SC01/02 Holder Application: Super alloys	862 20 009
2.3.5	Insert Type C0904CB for SC01/02 Holder Application: Hard seats	862 20 010
2.3.6	Insert Type C0904HB for SC01/02 Holder Application: Cr & Ni alloys	862 20 013
2.3.7	Insert Type C0904HU for SC01/02 Holder Application: Very hard seats	862 20 015
2.3.8	Insert Type C0904CBN for SC01/02 Holder Application: Extremely hard seats	862 20 022
3.	<u>Accessories for face turning</u>	
3.1	D5/0° Face Turning Head for diam. 46-140mm	247 19 500
3.2	Insert Holders for face turning	
3.2.1	SC1-0° Insert Holder for diam. range 35-60 mm	247 65 111
3.2.2	SC2-0° Insert Holder for diam. range 55-140 mm	247 65 119
3.3	Cutting Inserts for Face Turning	
3.3.1	Insert C0904CB for cast iron	862 20 010
4.	<u>Accessories for aligning and guiding the machine</u>	
4.1	Pilots tailored to the respective engine models	on request
4.1.1	Universal Pilot Kit für valve seat diameter range 16-27 mm	247 70 100
4.2	Supporting Spiders for supporting pilot shaft just below the valve seat	on request
4.3	Chamfering Tools for cleaning the valve guide bore	on request
5.	Storage Case	247 90 038



**Modular Machine
for Refacing Valve Seats, Counterboring Seat Ring Pockets and
Resurfacing Sealing Surfaces**



VD4HD Valve Seat Refacing Machine



VD4HD-ADM Counterboring Machine



VD4HD-RC Resurfacing Machine

APPLICATION

The HUNGER VD4HD is a versatile machine offering a choice of modular components for

- refacing valve seats,
- counterboring seat ring pockets of large diesel and gas engines and
- resurfacing the sealing surfaces on cylinder heads, cylinder liners and engine blocks.

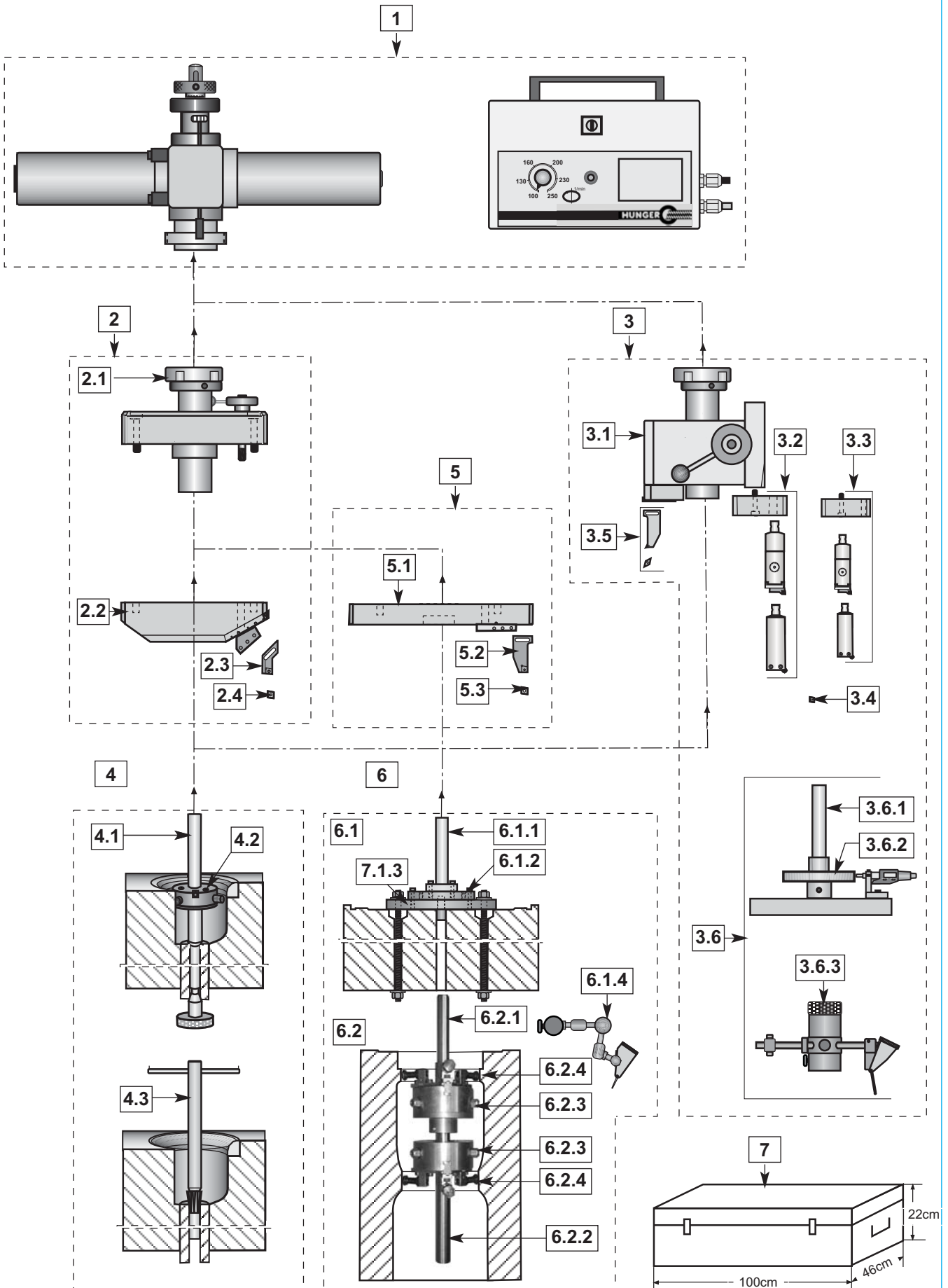
KEY FEATURES

- No abrasive dust. A fast clean cut.
- Compact and handy design.
- Modular add-on components provide a flexible solution for multiple projects.
- Powered by SELV (Safety Extra Low Voltage) to avoid risk of electrical shock.
- Universal power supply with wide input voltage range.
- Fast set-up time.
- Easy to use
- The economical solution for both field and workshop use.
- Successfully tested and approved by leading engine manufacturers.

SPECIFICATIONS

Valve Seat Refacing Capacity	
Valve seat diameter range	60 - 230 mm
Valve seat angle range	19,5° - 45°
Counterboring Diameter Range	66 - 225 mm
Face Turning Diameter Range	70 - 500 mm
Rotational Speed Range	100 - 250 rpm
Feed per revolution	0,05 mm
Electrics	
Universal Input Voltage Range	100 - 300 VAC 1 Ph 50/60 Hz
Power Requirement	0,5 kW
Operating Voltage of Drive Unit	max. 50 VDC
Dimensions	
Motor Drive Unit	
Length	485 mm
Width	175 mm
Height	210 mm
Universal Power Supply Unit	
Length	380 mm
Width	180 mm
Height	210 mm
Net Weights	
Machine Drive Unit	7,5 kg
Valve Seat Refacing Gear Unit	6,5 kg
Valve Seat Refacing Head	5,1 kg
Counterboring and Facing Head	13,6 kg
Face Turning Head	7,1 kg
Universal Power Supply Unit	7,7 kg

THE MODULAR COMPONENTS



THE MODULAR COMPONENTS

Item	Description	Part Number	Item	Description	Part Number
1.	VD4HD Motor Drive Unit including Universal Power Supply Unit wired for input voltage range 100 - 300 VAC	249 05 350	3.5	Tooling for Facing Bottom of Counterbore	
2.	Accessories for Refacing Valve Seats		3.5.1	H01 Insert holder for diameter range 60-160 mm	259 65 110
2.1	VD4 Seat Refacing Gear	249 10 310	3.5.2	H02 Insert holder for diameter range 100-220	259 65 120
2.2	D4 Valve Seat Refacing Heads		3.5.3	Cutting Insert Type D1104CU for H01/02 Holder	862 20 030
2.2.1	D4/45° Seat Refacing Head for 45° seats	249 11 345	3.6	Optional Accessories for ease of operation	
2.2.2	D4/40° Seat Refacing Head for 40° seats	249 11 340	3.6.1	Boring Tool Setting Stand Includes digital micrometer screw for precise setting of the boring diameter	259 50 100
2.2.3	D4/30° Seat Refacing Head for 30° seats	249 12 330	3.6.2	Reference Disk for setting micrometer screw to a reference diameter near to the desired oversize diameter	259 50 xxx
2.2.4	D4/20° Seat Refacing Head for 20° seats	249 17 320	3.6.3	DP4 Bore Gauge for checking diameter of seat ring pocket	249 93 701
2.2.5	D4/19,5° Seat Refacing Head for 19,5° seats	249 18 319	4.	Alignment Accessories for Refacing & Boring	
2.3	Insert Holders for Refacing Valve Seats		41	Pilots for insertion into the valve guides	
2.3.1	SD00 Insert Holder for seat diam. 60-100 mm	247 65 108	4.1.1	Customized Pilots each tailored to a particular engine model	on request
2.3.2	SC01 Insert Holder for seat diam. 90-140 mm	247 65 103	4.1.2	UP4.1 Universal Pilot Kit for valve guide bore range 16-27mm	249 70 410
2.3.3	SC02 Insert Holder for seat diam. 130-230 mm	247 65 104	4.1.3	UP4.2 Universal Pilot Kit for valve guide bore range 27-40mm	249 70 420
2.4	Inserts for Refacing Valve Seats		4.2	Supporting Spiders for supporting pilot shaft just below the seat	on request
2.4.1	Insert Type C0604CB for SD00 Holder Application: General purpose	862 20 021	4.3	Chamfering Tools for cleaning the valve guide	on request
2.4.2	Insert Type C0602HB for SD00 Holder Application: Very hard seats	862 20 016	5.	RC Accessories for Face Turning	
2.4.3	Insert Type C0908CU for SC01/02 Holder Application: General purpose	862 20 007	5.1	Face Turning Heads	
2.4.4	Insert Type C0908HU for SC01/02 Holder Application: Super alloys	862 20 009	5.1.1	D4.1/0° Face Turning Head for facing diameter range 70 - 330 mm	249 20 200
2.4.5	Insert Type C0904CB for SC01/02 Holder Application: Hard seats	862 20 010	5.1.2	D4.2/0° Face Turning Head for facing diameter range 75 - 370 mm	249 20 300
2.4.6	Insert Type C0904HB for SC01/02 Holder Application: Cr & Ni alloys	862 20 013	5.1.3	D4.5/0° Face Turning Head for facing diameter range 95 - 500 mm	249 20 450
2.4.7	Insert Type C0904HU for SC01/02 Holder Application: Very hard seats	862 20 015	5.2	Insert Holder for Face Turning	
2.4.8	Insert Type C0904CBN for SC01/02 Holder Application: Extremely hard seats	862 20 022	5.2.1	HC02.1 Insert Holder L=75mm for refacing sealing surface on engine block	247 65 121
3.	ADM Accessories for Counterboring		5.2.2	HC02.2 Insert Holder L=100mm for refacing sealing surface on cylinder head	247 65 126
3.1	Boring Heads		5.3	Insert for Face Turning	
3.1.1	AV Boring Head including vertical tool slide for counterboring	259 10 500	3.3.1	Insert Type C0904CB	862 20 010
3.1.2	AVH Boring and Facing Head including vertical tool slide for counterboring and	259 10 570	6.1	Alignment Accessories for Resurfacing Cylinder Heads	
3.2	Tooling for Diameter Range 90-225mm		6.1.1	Guide Pin	249 71 005
3.2.1	Boring Tool Base Type B1 for diam. 90-	259 12 060	6.1.2	Aligning Disk	258 79 700
3.2.2	Precision Boring Tool Type B1 Boring diameter range 90-225mm	259 12 120	6.1.3	Mounting Assembly tailored to the respective engine model(s)	on request
3.2.3	Form Boring Tool Type B1 Boring diameter range 90-225mm. For machi- ning	259 20 150	6.1.4	Concentricity Gauge	258 93 350
3.3	Tooling for Diameter Range 66-225mm		6.2	Alignment Accessories for Resurfacing Engine Blocks	
3.3.1	Boring Tool Base Type D1	259 14 061	6.2.1	Guide Pin (Same as 6.1.1)	249 71 005
3.3.2	Boring Tool Base Type D1.1	259 14 062	6.2.2	Pilot Spindle	258 71 010
3.3.3	Precision Boring Tool Type D1 Boring diameter range 72-100mm	259 14 110	6.2.3	Set (2 pcs) of Centering Chucks	258 71 200
3.3.4	Form Boring Tool Type D1 Boring diameter range 72-100mm. For machi- ning	259 20 821	6.2.4	Sets (6pcs) of Top Jaws	on request
3.4	Insert for Precision Boring Tools B1 an D1		7.	Storage Boxes for machine and accessories	
3.4.1	Insert Type C0604HC	862 20 050	7.1	Storage Box, Standard Size	249 90 046
			7.2	Storage Box, Oversize	249 90 000

REFACING VALVE SEATS

The **VD4HD Valve Seat Refacing Machine** is composed of

- VD4HD motor drive unit,
- VD4 seat refacing gear unit attached to the motor drive unit by means of a union nut and the appropriate
- D4/xx° seat refacing head bolted the VD4 seat refacing gear unit.

The VD4HD motor drive unit is fitted with two motors resulting in a smooth cutting action.

The operating voltage supplied to the motors by a separate universal power supply unit is of the low voltage type to eliminate electric hazards.

The speed of the motors is infinitely variable so that the cutting speed can be adapted to the diameter and material to be refaced.

The universal power supply unit is wired for connection to AC line voltages within a range of from 100 V to 300 V.

VD4/xx° valve refacing heads are available for the popular valve face angles and also for customized seat angles.

Each D4/xx° valve refacing head features a built-in slideway for cutting tool travel to eliminate faulty angle setting operations and to ensure the same precise angle time and again.

The VD4HD valve seat refacing machine is aligned in centerline with the valve guide by a pilot which is inserted into the valve guide and stabilized by a supporting spider just below the valve seat.

Pilots and supporting spiders supplied for an old VD4E valve seat refacing machine can be also used for the VD4HD.

The valve seat is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

While the cutting insert rotates in a circle around the valve seat, a feed gear mechanism ensures a continuous outward transverse feed motion under the proper seat angle.

The lathe-type refacing action provides a flawless concentric seating surface texture for a perfect valve seal.

Roundness, concentricity and surface finish of the refaced valve seat are within manufacturers' specifications or even better.

Setup is fast and easy.

First, insert the pilot with mounted supporting spider in the valve guide.

Then, lower the VD4HD over the pilot and, using rapid traverse lever, position the cutting edge of the cutting tool in front of the inner edge of the valve seat.

Connect the the output cable of the separate power supply unit to the machine and the input cable to the mains.

Select the depth of cut by tuning micrometer downfeed. One graduation of the downfeed scale correspond to 0,025 mm downfeed.

Select the desired cutting speed.

Refacing is automatic.

Pressing one button is enough to start the refacing pass.

Two to three passes are enough to restore the valve seat to the original condition.

COUNTERBORING

The **VD4HD-ADM Counterboring Machine** is composed of

- VD4HD motor drive unit and
- AV boring head attached to the motor drive unit by means of a union nut.

Two types of boring beads are available.

The standard AV boring head is provided with a vertical slide for counterboring the seat ring pockets.

The AVH boring and facing head is provided with both a vertical slide for counterboring the seat ring pockets and a horizontal slide for facing the bottom of the seat ring pockets.

The pilots and supporting spiders supplied for valve seat refacing can be also used for aligning the VD4HD-ADM counterboring machine in centerline with the valve guide.

The precision boring tools includes a vernier dial for adjusting the boring diameter in increments of 2 µm to ensure high precision machining to IT6 tolerances.

Form boring tools are available for chamfering shoulders within the counterbores to facilitate O-ring installation.

A boring tool setting stand can be supplied as an option for presetting the precision boring tool to the desired boring diameter.

The boring tool setting stand includes a micrometer screw which can be set a diameter value near to the desired boring diameter by means of a corresponding reference disk.

To preset the precision boring tool to the desired boring diameter, the VD4HD-ADM is placed on the boring tool setting stand and then the setting of the micrometer screw is used as reference value for adjusting the precision boring tool to the desired boring diameter by means of the vernier dial.

An optional bore gauge is available as an accessory to the boring tool setting stand for checking the diameter of the seat ring bore while the pilot is inserted in the valve guide. The dial test indicator of the bore gauge is set to a value corresponding to the desired bore diameter at the tool setting stand and then the bore gauge is placed on the pilot to check the diameter of the seat ring bore

RESURFACING SEALING SURFACES

The **VD4HD-RC Face Turning Machine** is composed of

- VD4HD motor drive unit,
- VD4 seat refacing gear unit attached to the motor drive unit by means of a union nut and a
- D4.x/0° face turning head bolted the VD4 seat refacing gear unit.

Face turning heads is available for resurfacing seating surfaces of various diameters on cylinder heads and engine blocks.

The VD4HD-RC face turning machine is aligned square to the sealing surface by alignment accessories being mounted to the cylinder head or engine block.

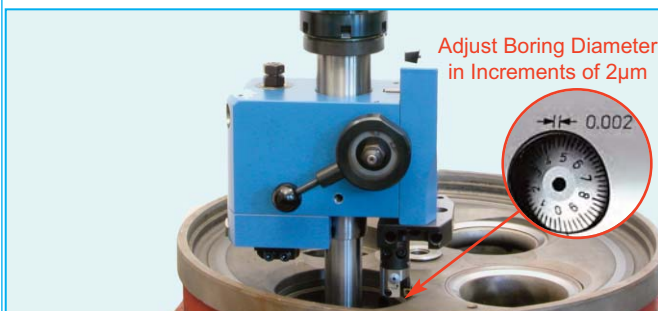
**Modular Machine
for Refacing Valves and Valve Seats, Resurfacing Sealing Surfaces
and Counterboring Seat Ring Pockets**



UDM4E-VK Valve Refacing Machine



UDM4E-VD Valve Seat Refacing Machine



UDM4E-ADM Counterboring Machine



UDM4E-RC Face Turning Machine

APPLICATION

The HUNGER UDM4E is a versatile machine offering a choice of modular components for

- refacing valves,
- refacing valve seats,
- resurfacing the sealing surfaces on cylinder heads, cylinder liners and engine blocks of large diesel and gas engines and
- counterboring seat ring pockets

KEY FEATURES

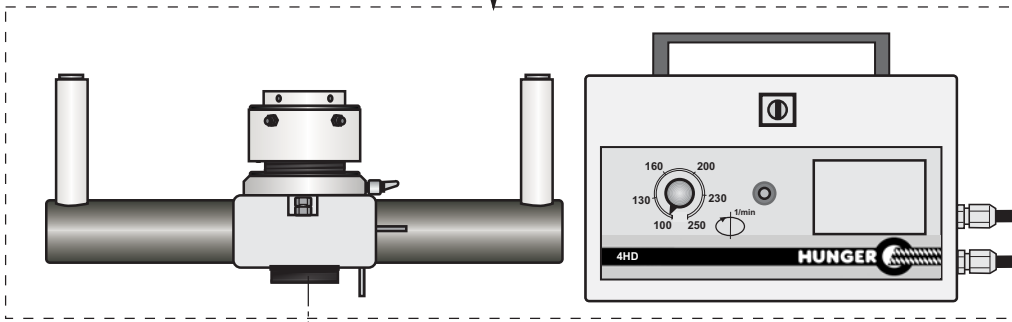
- No abrasive dust. A fast clean cut.
- Compact and handy design.
- Modular add-on components provide a flexible solution for multiple projects.
- Powered by SELV (Safety Extra Low Voltage) to avoid risk of electrical hazard.
- Power supply with universal AC input.
- Fast set-up time.
- Easy to use
- The economical solution for both field and workshop use.
- Successfully tested and approved by leading engine manufacturers.

SPECIFICATIONS

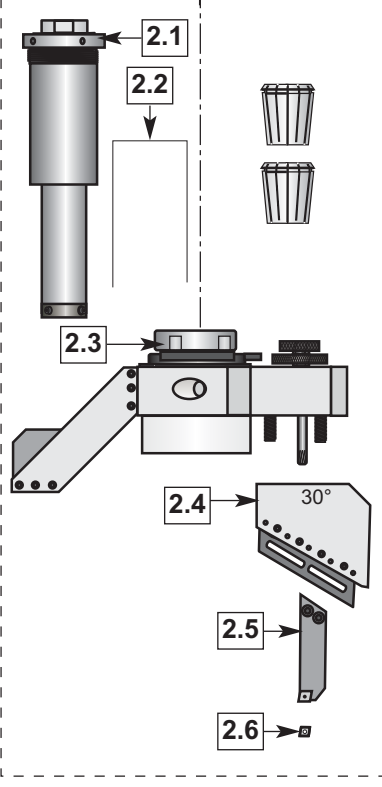
Valve Refacing Capacity	
Valve stem diameter range	16 - 37 mm
Valve face diameter range	60 - 230 mm
Valve angle range	45°- 20°
Valve Length	400 mm
Valve seat refacing capacity:	
Valve seat diameter range	60 - 230 mm
Valve seat angle range	45°-19,5°
Counterboring Diameter Range	66 - 225 mm
Face Turning Diameter Range	75 - 500 mm
Rotational Speed Range	100 - 230 rpm
Electrics	
Universal Input Voltage Range	100 - 300 VAC
Power Requirement	0,5 kW
Operating Voltage of Drive Unit	max. 58 VDC
Dimensions	
Motor Drive Unit	
Length/Width/Height	485/175/210 mm
Universal Power Supply Unit	
Length/Width/Height	380/180/210 mm
Net Weights	
Machine Drive Unit	7,5 kg
Collet Chuck for clamping the valves	2,6 kg
Valve Refacing Gear Unit	6,3 kg
Valve Refacing Head	1,6 kg
Universal Power Supply Unit	7,7 kg
Seat Refacing Gear Unit	6,5 kg
Seat Refacing Head	5,1 kg

THE MODULAR COMPONENTS

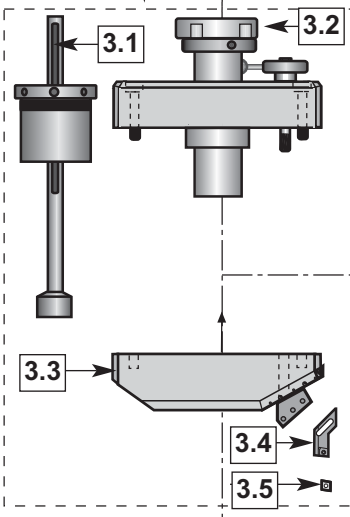
1



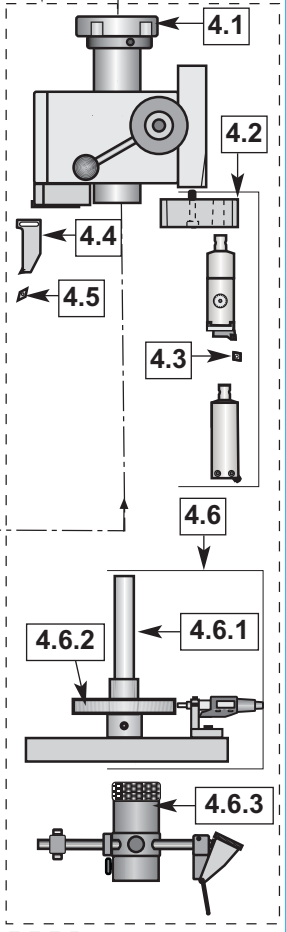
2



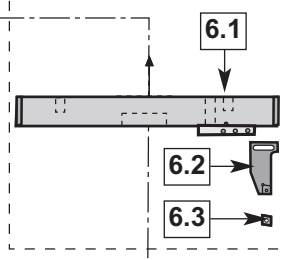
3



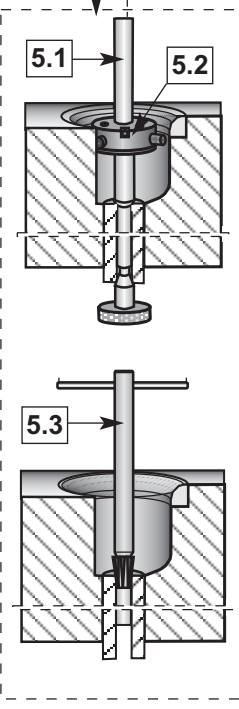
4



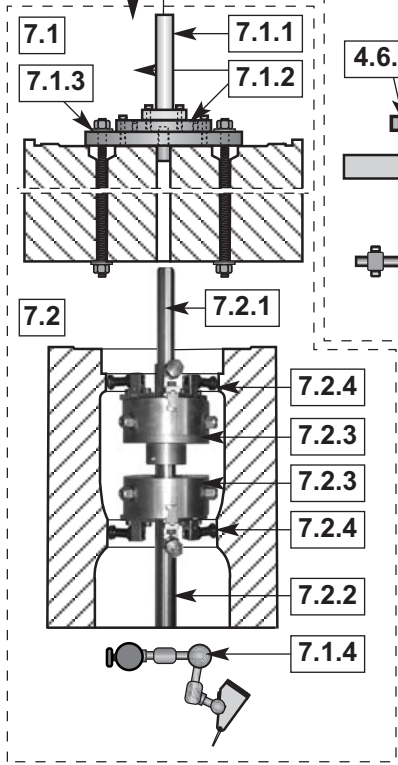
6



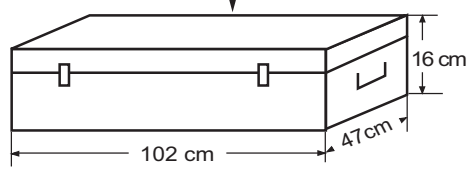
5



7



8



THE MODULAR COMPONENTS

Item	Description	P/N	Item	Description	P/N
1.	UDM4E Motor Drive Unit including Universal Power Supply Unit wired for input voltage range 100 - 300 VAC	280 01 001	4.2	Tooling for counterboring Type Diameter Range	
2.	<u>VK Accessories for Refacing Valves</u>		4.2.1	Boring Tool Base Type B1 90-225 mm	259 12 060
2.1	Collet Chuck	280 31 000	4.2.2	Precision Boring Tool Type B1 90-225 mm	259 12 120
2.2	Collets for Chucking the Valves		4.2.3	Form Boring Tool Type B1 90-225 mm	259 20 150
2.2.1	V18 Collet Set for valve stem diam. 18-16 mm	279 50 018	4.2.4	Boring Tool Base Type D1 72-100 mm	259 14 061
2.2.1	V20 Collet Set for valve stem diam. 20-18 mm	279 50 020	4.2.5	Boring Tool Base Type D1.1 66-100 mm	259 14 062
2.2.2	V22 Collet Set for valve stem diam. 22-20 mm	279 50 022	4.2.6	Precision Boring Tool Type D1 66-100 mm	259 14 110
2.2.3	V24 Collet Set for valve stem diam. 24-22 mm	279 50 024	4.2.7	Form Boring Tool Type D1 66-100 mm	259 20 821
2.2.4	V26 Collet Set for valve stem diam. 26-24 mm	279 50 026	4.3	Insert for Precision Boring Tools B1 an D1	
2.2.5	V28 Collet Set for valve stem diam. 28-26 mm	279 50 028	4.3.1	Insert Type C0604HC	862 20 050
2.2.6	V30 Collet Set for valve stem diam. 30-28 mm	279 50 030	4.4	Tooling for Facing Bottom of Counterbore	
2.2.7	V32 Collet Set for valve stem diam. 32-30 mm	279 50 032	4.4.1	H01 Insert holder for diam. 60-160 mm	259 65 110
2.2.8	V34 Collet Set for valve stem diam. 34-32 mm	279 50 034	4.4.2	H02 Insert holder for diam. 100-220 mm	259 65 120
2.2.9	V36 Collet Set for valve stem diam. 36-34 mm	279 50 036	4.5	Insert for Facing Bottom of Counterbore	
2.3.	VK Valve Refacing Gear Unit	280 11 000	4.5.1	Insert Type W1104CU for H01/02 Holder	862 20 030
2.4	Valve Refacing Heads		4.6	Optional Accessories for Setting Boring Diam.	
2.4.1	V4/45° Valve Refacing Head for 45° valves	280 25 000	4.6.1	Boring Tool Setting Stand Includes digital micrometer screw for precise setting of the boring diameter	259 50 100
2.4.2	V4/40° Valve Refacing Head for 40° valves	280 24 000	4.6.2	Reference Disks for setting micrometer screw to a reference diameter near to the desired oversize diameter	259 50 xxx
2.4.3	V4/30° Valve Refacing Head for 30° valves	280 23 000	4.6.3	DP4 Bore Gauge for checking diameter of seat ring bore	249 93 701
2.4.4	V4/20° Valve Refacing Head for 20° valves	280 22 000	5.	Alignment for Seat Refacing & Counterbo-	
2.5	Insert Holder for Valve Refacing		5.1.1	Customized Pilots tailored to particelat engine model	on request
2.5.1	VK01 Insert Holder short version	280 65 103	5.1.2	UP4.1 Universal Pilot Kit for valve guide bore range 16-27mm	249 70 410
2.5.2	VK02 Insert Holder long version	280 65 104	5.1.3	UP4.2 Universal Pilot Kit for valve guide bore range 27-40mm	249 70 420
2.6	Cutting Inserts		5.2	Supporting Spiders for supporting pilot shaft just below the seat	on request
2.6.1	Insert Type C0904CB (General purpose)	862 20 010	5.3	Chamfering Tools for cleaning the valve guide	on request
2.6.2	Insert Type C0904HB (Cr & Ni alloys)	862 20 013	6.	RC Accessories for Face Turning	
2.6.3	Insert Type C0904HU (Hard materials)	862 20 015	6.1	Facing Heads	
2.6.4	Insert Type C0904CBN (Very hard materials)	862 20 022	6.1.1	D4.1/0° Facing Head 70 - 330 mm	249 20 200
3.	<u>VD Accessories for Refacing Valve Seats</u>		6.1.2	D4.2/0° Facing Head 75 - 370 mm	249 20 300
3.1	Depth Stop Assembly	280 32 000	6.1.3	D4.5/0° Facing Head 95 - 500 mm	249 20 450
3.2	VD Seat Refacing Gear Unit	249 10 310	6.2	Insert Holder for Face Turning	
3.3	Valve Seat Refacing Heads		6.2.1	HC02.1 Insert Holder L=75mm for engine block	247 65 121
3.3.1	D4/45° Seat Refacing Head for 45° seats	249 11 345	6.2.2	HC02.2 Insert Holder L=100mm for cylinder head	247 65 126
3.3.2	D4/40° Seat Refacing Head for 40° seats	249 11 340	6.3	Cutting Insert for Face Turning	
3.3.3	D4/30° Seat Refacing Head for 30° seats	249 12 330	6.3.1	Insert Type C0904CB	862 20 010
3.3.4	D4/20° Seat Refacing Head for 20° seats	249 17 320	7.1	Alignment for resurfacing cylinder head	
3.3.5	D4/19,5° Seat Refacing Head for 19,5° seats	249 18 319	7.1.1	Guide Pin	249 71 005
3.4	Insert Holders for Refacing Valve Seats		7.1.2	Aligning Disk	258 79 700
3.4.1	SD00 Insert Holder for seat diam. 60-100 mm	247 65 108	7.1.3	Mounting Assembly tailored to the respective engine model	on request
3.4.2	SC01 Insert Holder for seat diam. 90-140 mm	247 65 103	7.1.4	Concentricity Gauge	258 93 350
3.4.3	SC02 Insert Holder for seat diam. 130-250 mm	247 65 104	7.2	Alingment for resurfacing engine blocks	
3.5	Cutting Inserts for Refacing Valve Seats Type Suitable Application for Holder		7.2.1	Pilot Pin (Same as 7.1.1)	249 71 005
3.5.1	Insert C0604CB SD00 General purpose	862 20 021	7.2.2	Pilot Spindle	258 71 010
3.5.2	Insert C0602HB SD00 Very hard seats	862 20 016	7.2.3	Set (2 pcs) of Centering Chucks	258 71 200
3.5.3	Insert C0908CU SC01/02 General purpose	862 20 007	7.2.4	Sets (6pcs) of Top Jaws for ID 190-300 mm	258 71 220
3.5.4	Insert C0908HU SC01/02 Super alloys	862 20 009	7.2.5	Sets (6pcs) of Top Jaws for ID 290-430 mm	258 71 240
3.5.5	Insert C0904CB SC01/02 Hard seats	862 20 010	8.	Storage Box	280 90 100
3.5.6	Insert C0904HB SC01/02 Cr & Ni alloys	862 20 013			
3.5.7	Insert C0904HU SC01/02 Very hard seats	862 20 015			
3.5.8	Insert C0904CBN SC01/02 Extremely hard seats	862 20 022			
4.	<u>ADM Accessories for Counterboring</u>				
4.1	Boring Heads				
4.1.1	AV Boring Head including vertical tool slide	259 10 500			
4.1.2	AVH Boring & Facing Head including vertical and horizontal tool slide	259 10 570			

REFACING VALVES

The **UDM4E-VK Valve Refacing Machine** consists of

- UDM4E motor drive unit,
- VK valve refacing gear unit screwed to shaft of the motor drive unit and
- V4/xx° valve refacing head bolted bolted to the VK valve refacing gear unit.

The UDM4E motor drive unit is fitted with two motors providing a smooth cutting action.

The operating voltage supplied to the motors by a separate universal power supply unit is of the low voltage type to eliminate electric hazards.

The speed of the motors is infinitely variable so that the cutting speed can be adapted to the diameter and material to be refaced.

The universal power supply unit is wired for connection to a voltages within a broad range of from 100V to 300V. V4/xx° valve refacing heads are available for the popular valve face angles and also for customized angles.

Each V4/xx° valve refacing head features a built-in slide-way for cutting tool travel to eliminate faulty angle setting operations and to ensure the same precise angle time and again.

The stem of the valve is placed into a collet chuck which is inserted into the hollow drive shaft of UDM4E drive unit.

Two collets are arranged in tandem for precise alignment of the valves.

The valve face is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

While the cutting tool rotates in a circle around the surface, a feed gear mechanism ensures a continuous transverse feed motion under the appropriate angle.

The lathe-type refacing action provides a flawless concentric surface texture for a perfect seal.

Roundness, concentricity and surface finish of the refaced faces are within manufacturers' specifications or even better.

REFACING VALVE SEATS

The **UDM4E-VD Valve Seat Refacing Machine** consists of

- UDM4E motor drive unit,
- VD seat refacing gear unit screwed to shaft of the UDM4E motor drive unit and
- D4/xx° seat refacing head bolted to the VD valve refacing gear unit.

The UDM4E-VD valve seat refacing machine is aligned in centerline with the valve guide by a pilot which is inserted into the valve guide and stabilized by a supporting spider just below the valve seat.

The valve seat is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

COUNTERBORING

The **UDM4E-ADM Counterboring Machine** consists of

- UDM4E motor drive unit and
- AV or AVH boring head screwed to the drive shaft of the UDM4E motor drive unit

The standard AV boring head is provided with a vertical slide for counterboring the seat ring pockets.

The AVH boring and facing head is provided with both a vertical slide for counterboring the seat ring pockets and a horizontal slide for facing the bottom of the seat ring pockets.

The pilots and supporting spiders supplied for valve seat refacing can be also used for aligning the UDM4E-ADM counterboring machine in centerline with the valve guide.

The precision boring tools are equipped with a vernier dial for adjusting the boring diameter in increments of 2 µm to ensure high precision machining to IT6 tolerances.

Form boring tools are available for machining the shoulders within the counterbores under special angles to facilitate O-ring installation.

To preset the precision boring tool to the desired boring diameter, the VD4HD-ADM is placed on the boring tool setting stand and then the setting of the micrometer screw is used as reference value for adjusting the precision boring tool to the desired boring diameter by means of the vernier dial.

An optional bore gauge is available as an accessory to the boring tool setting stand for checking the diameter of the seat ring bore while the pilot is inserted in the valve guide.

The dial test indicator of the bore gauge is set to a value corresponding to the desired bore diameter at the tool setting stand and then the bore gauge is placed on the pilot to check the diameter of the seat ring bore

RESURFACING SEALING SURFACES

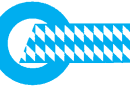
The **UDM4E-RC Face Turning Machine** consists of

- VD4HD motor drive unit,
- DG4 seat refacing gear unit screwed to the drive shaft of motor drive unit and a
- D4.x/0° face turning head bolted the VD seat refacing gear unit.

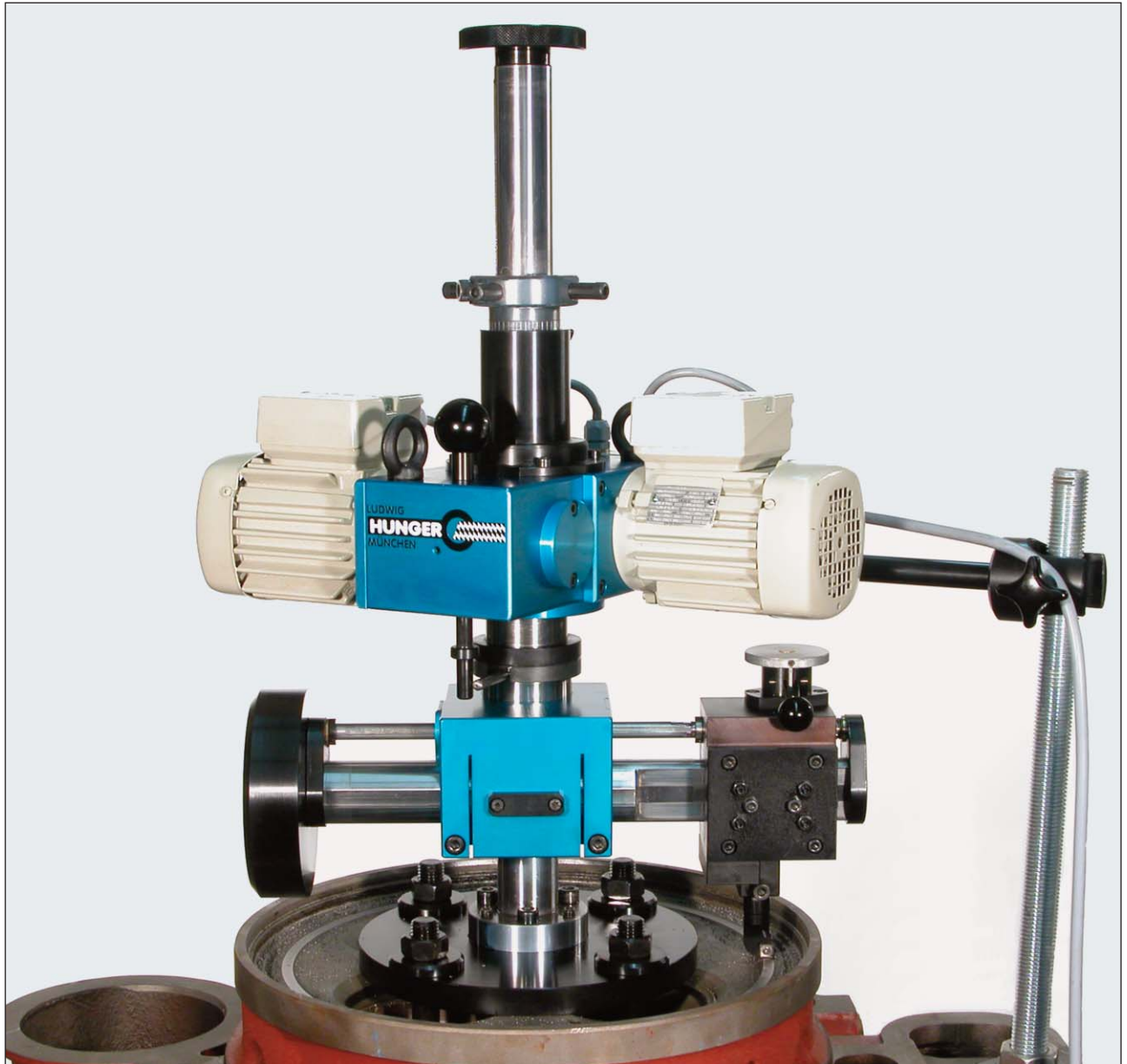
Face turning heads is available for resurfacing sealing surfaces of various diameters on cylinder heads and engine blocks.

The VD4HD-RC face turning machine is aligned square to the sealing surface by alignment accessories being mounted to the cylinder head or engine block.

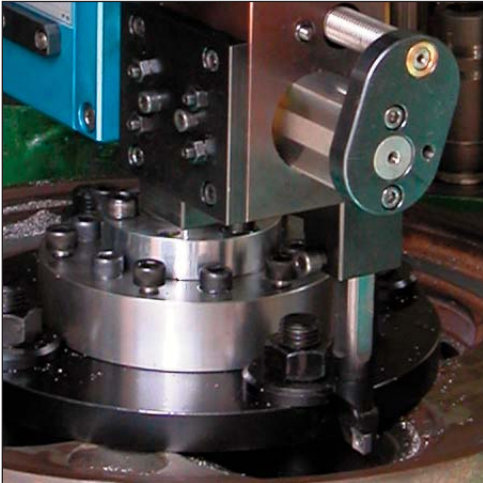
The sealing surface is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.



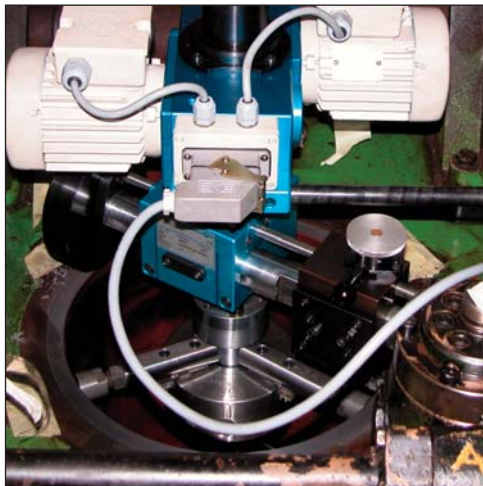
**RCM Face Turning Machine
for Diameter Range 200 - 720mm.**



**The RCM is designed to resurface
the cylinder liner landing surface on the engine block
and
the cylinder liner landing surface on the cylinder head**



Resurfacing Cylinder Head



Resurfacing Engine Block



Pilot for Engine Block

Working Principle.

The RCM resurfaces the landing surface in a lathe-type facing action, i.e. the seating is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the single point cutting tool.

While the cutting tool rotates around the surface, a feed gear mechanism ensures a continuous outward transverse feed motion.

The lathe-type refacing action provides a flawless concentric surface texture for a perfect seal.

Features.

The RCM is fitted with two motors providing a smooth cutting action.

The speed of the motors is infinitely variable so that the cutting speed can be adapted to the diameter and material of the seating.

A separate power supply unit is provided for ease of operation.

A small hand-held remote control is supplied so that the operator can conveniently switch on and off the machine while watching the refacing operation.

The remote control includes an emergency stop to stop the machine in case of emergency.

The power supply unit is connected to single phase input voltage and supplies the three phase operating voltage for the drive motors.

The RCM is centered by a pilot tailored to the specific engine component to be serviced.

The cutting tool comprises an insert holder fitted with an index-able carbide cutting insert.

Specifications.

Capacity.

Facing diam.	200 - 720mm
Max. facing travel	50 mm

Machining motions.

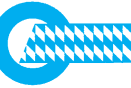
Speed range	25 - 120 rpm
Feed rate	0,1 mm/rev.

Electrics:

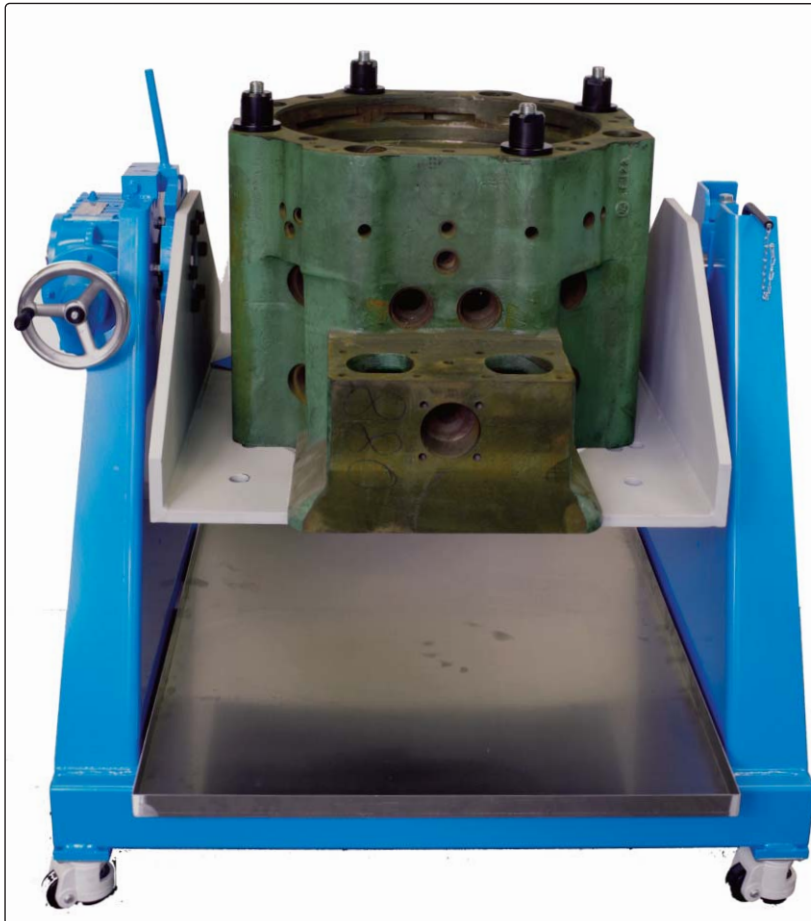
Supply voltage:	230V±10%
(1-phase.50/60Hz)	
Power consumption	1,4 kW

Dimensions & Weight:

Width/Height	500/600 mm
Net weight	ca. 50 kg



WV Cylinder Head Stand for repair and maintenance of the cylinder heads of large diesel and gas engines



An extremely **sturdy support** for the heavy cylinder heads of large diesel engines allows **all round service** carried out with **ease and safety**

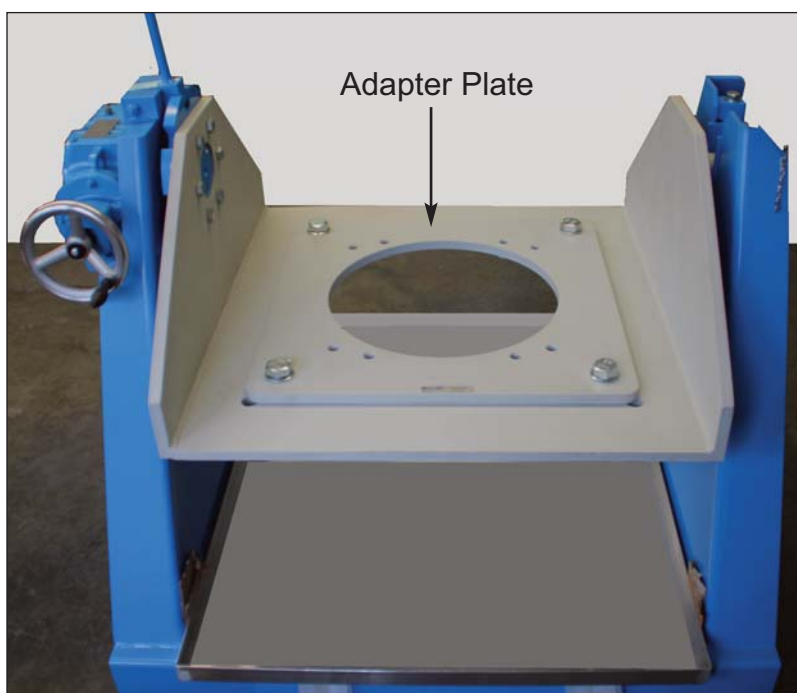
The cylinder head **rotates through 360°** and can be locked in any position which is most suitable for the work to be performed.

A removeable tray provided in the bottom frame collects any liquid from the cylinder head.

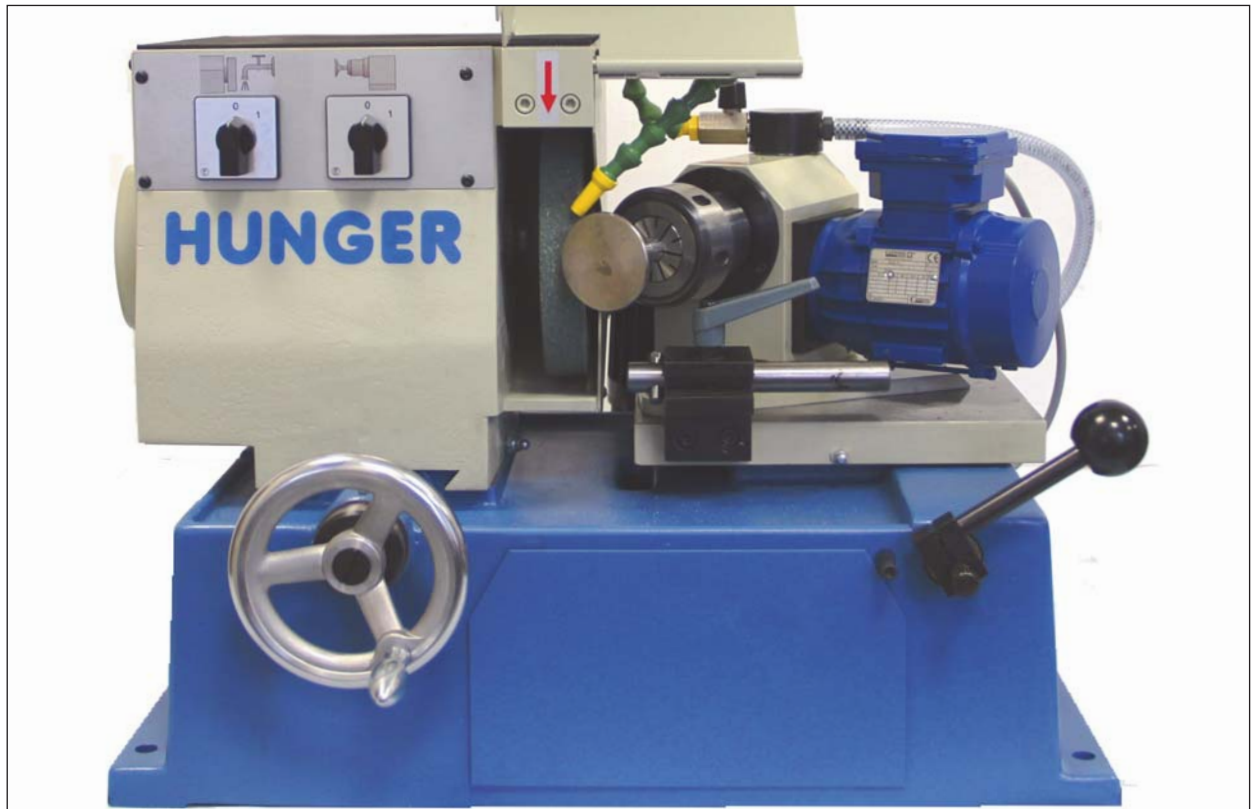
As shown at the bottom left, an adapter plate can be attached to the bottom of the standard trough type mounting assembly to mount cylinder heads of smaller engines.

As an option, casters can be fitted to the bottom frame so so that the cylinder head stand can be easily moved around in the workshop. Locking knobs are provided at the casters to lock the cylinder head stand in place.

The WV cylinder head stand can be also used for storing a spare cylinder head.



VKM1M Valve Grinding Machine for Valves with Stem Diameter up to 20 mm



Specifications

Capacity

Valve stem diameter range	6-20 mm
Max. valve face diam.	120 mm
Valve angle range	18° - 47°

Grinding Spindle

Grinding Wheel Diameter	175 mm
Speed	2790 rpm

Work Spindle

Speed	105 rpm
Optioninal variable speed	10 - 170 rpm

Coolant System

Capacity	5 l
----------	-----

Electrics

Supply voltage	400V±10%
(3-phase, 50/60Hz)	or 230V±10%
Power consumption	0,5 kW

Overall Dimensions

Length	620 mm
Width	610 mm
Height	450 mm

Weight:

Net weight	ca. 105 kg
------------	------------

Features

Machine Base.

Heavily ribbed cast iron structure for vibration-free performance. Adjustable slideways for wheelhead infeed and workhead traverse ensure long-lasting accuracy. The machine base houses an industrial type flood pump for delivering coolant to the grinding site and a baffled coolant tank which can be drawn out for ease of cleaning.

Wheelhead.

Box type monobloc noted for its excellent vibration dampening characteristics. The precision motor grinding spindle is permanently sealed and lubricated.

Workhead.

Located on a swivel plate which can be set to the required angular position by means of a wide-spaced scale.

Dressing Attachment.

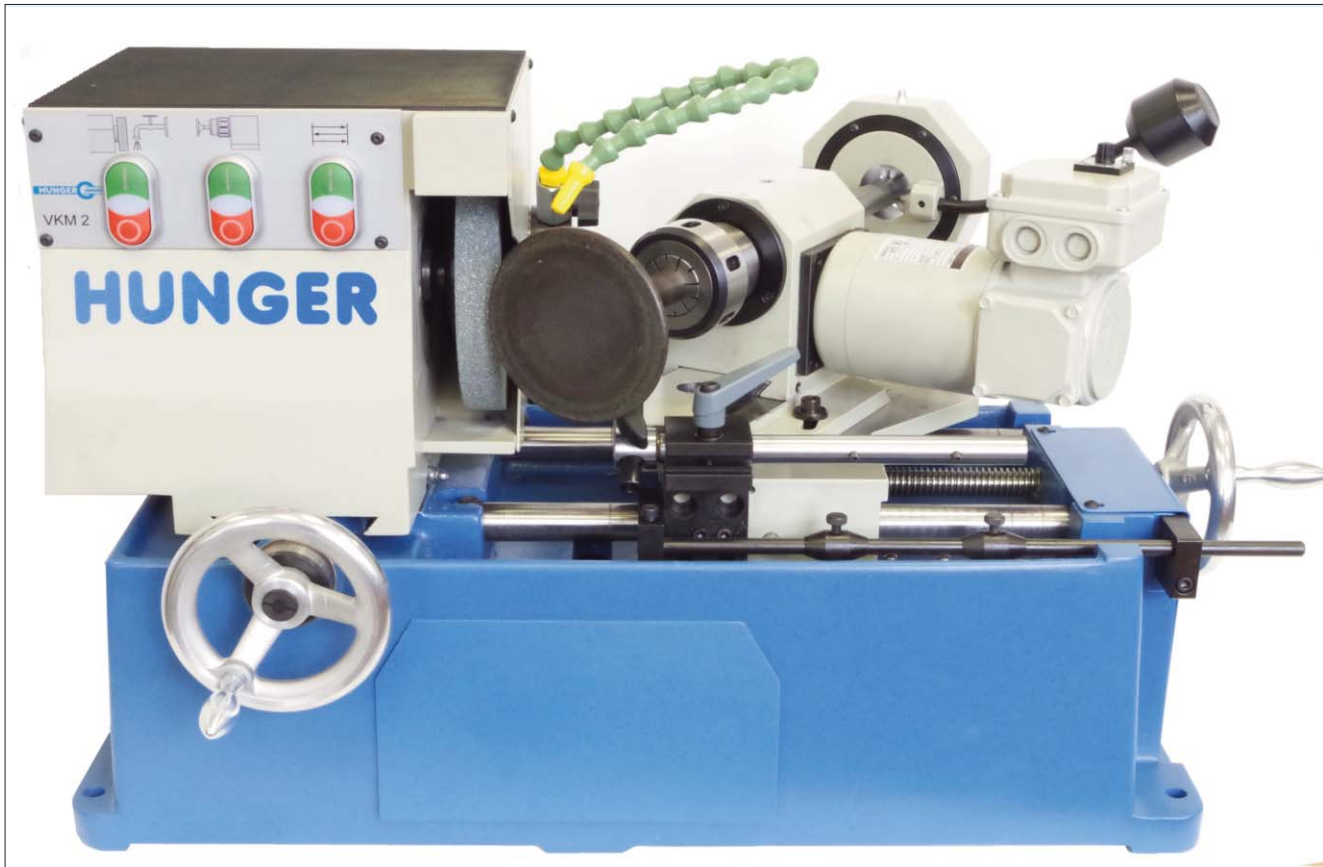
The dressing attachment is permanently mounted on the worktable for rapid wheel dressing.

Electric System.

Individual grinding spindle motor, work spindle motor and coolant pump motor all controlled by switches grouped in front of the wheelhead for ease of operation.

Main switch fitted with undervoltage release.

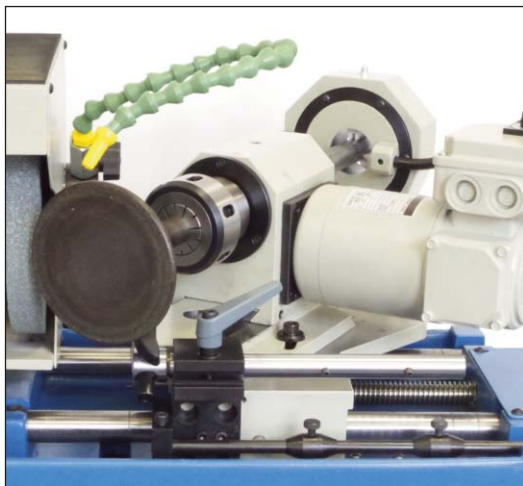
VKM2.3M
Valve Grinding Machine
for valves with Stem Diameter up to 32,5 mm.



If you are looking for
HIGH PRECISION
this is simply your machine.

Featuring the unique Hunger combination
of COLLET CHUCKING and SELF-CENTERING STEADYING
to ensure the ultimate in valve refacing accuracy.

Tested and specified by leading engine manufacturers.



Specifications

Capacity

Valve stem diameter range	6 - 32,5 mm
Max. valve face diam.	200 mm
Valve angle range	18° - 47°

Grinding Spindle

Grinding Wheel Diameter	175 mm
Speed	2790 rpm

Work Spindle

Speed, Standard	50 rpm
Adjustable Speed, Option	5 - 60 rpm

Coolant System

Capacity	5 l
----------	-----

Electrics

Supply voltage (3-phase, 50/60Hz)	400V±10% or 230V±10%
Power consumption	0,5 kW

Overall Dimensions

Length	800 mm
Width	550 mm
Height	450 mm

Weight:

Net weight	ca. 155 kg
------------	------------

Machine Base

Heavily ribbed cast iron structure with integrated slideway for the wheelhead .

The machine base houses an industrial type flood pump for delivering coolant to the grinding site and a baffled coolant tank which can be drawn out for ease of cleaning.

Wheelhead

Box type monobloc casting noted for excellent vibration dampening.

Permanently sealed and lubricated grinding spindle.

The wheelhead houses also the control panel,

Workhead and Steady Rest.

The monobloc workhead houses the permanently sealed and lubricated work spindle provided with a collet chuck for use of high precision collets.

The workhead and an unique selfcentering steady rest for additional support of long stem valves are placed on an elongated swivel plate which is adjustable with respect to a wide-spaced angular scale for setting the proper grinding angle.

Both the workhead and the steady rest are adjustable along the swivel plate to clamp each valve on that part of the valve stem which normally travels in the valve guide.

The combination of collet chucking and the unique Hunger steadying provides double support of long valves to ensure the ultimate in valve refacing accuracy.

Automated Oscillation (Option)

An oscillating attachment for automated power traverse of valve face across the grinding wheel is available as an option to ensure efficient stock removal and superior finish.

The stroke of oscillation is infinitely adjustable.

The workhead is mounted on guide bars to reduce friction and to ensure smooth traversing of the valve face across the grinding wheel.

Dressing Attachment.

The dressing attachment is permanently mounted on the worktable for rapid wheel dressing.

Electrics.

An individual motor is provided for each of the grinding spindle, the work spindle and the optional oscillation equipment.

Pus push buttons are provided for switching the grinding spindle motor and the coolant pump motor as well as the the grinding spindle motor and the optional oscillation drive motor.

The main switch is also the emergency switch.

VKM3.1 Valve Grinding Machine
for Valves with Stem Diameter from 9 to 32,5 mm.

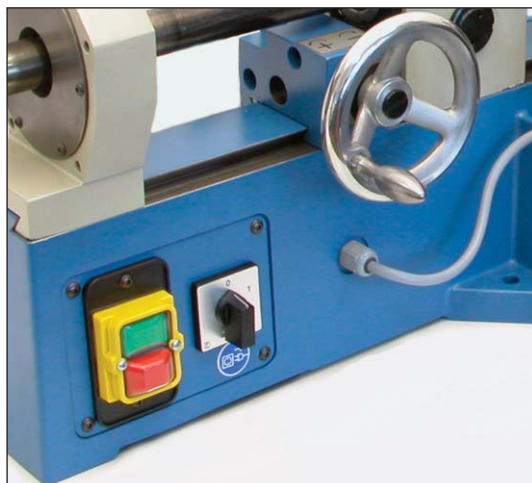


If you are looking for a
COMPACT MACHINE

for regrinding the valves of medium size engines
this is your first choice.

Featuring the unique Hunger combination
of SELF-CENTERING STEADYING and COLLET CHUCKING
to ensure the ultimate in valve refacing accuracy.

Tested and specified by leading engine manufacturers.



Specifications

Capacity

Valve stem diameter range	9 - 32,5 mm
Max. valve face diam.	200 mm
Valve angle range	18° - 47°

Grinding Spindle

Grinding Wheel Diameter	175 mm
Speed	2790 rpm

Work Spindle

Speed, Standard	25 rpm
-----------------	--------

Coolant System

Capacity	5 l
----------	-----

Electrics

Supply Voltage (3-phase, 50/60Hz)	400V±10% or 230V±10%
Power consumption	0,5 kW

Overall Dimensions

Length	800 mm
Width	550 mm
Height	500 mm

Weight:

Net weight	ca. 115 kg
------------	------------

Machine Base.

Heavily ribbed cast iron structure with integrated dove tailed slideway for the workhead and steady rest.

The machine base houses an industrial type flood pump for delivering coolant to the grinding site and a baffled drawer type coolant reservoir which can be drawn out for ease of cleaning.

The machine base houses also the control panel for the motors.

Grinding Spindle.

The permanently sealed and lubricated grinding spindle slides on a swivel plate which is provided with an integrated dove tailed slideway.

The swivel plate is set to the desired valve angle by means of a wide spaced scale.

Wheel Dressing Attachment.

The dressing attachment is permanently mounted on the machine base for rapid wheel dressing.

Workhead and Steady Rest.

The monobloc workhead houses the permanently sealed and lubricated work spindle provided with a collet chuck for use of high precision collets.

The workhead and an unique selfcentering steady rest for additional support of long stem valves are placed on an the slideway provided at the machine base.

Both the workhead and the steady rest are adjustable along the slideway to clamp each valve on that part of the valve stem which normally travels in the valve guide.

The combination of collet chucking and the unique Hunger steadying provides double support of long valves to ensure the ultimate in valve refacing accuracy.

A micrometer infeed unit is provided at the slideway on the machine base to feed the face of the valve clamped in the collet to the grinding wheel.

Electrics.

An individual motor is provided for each of the grinding spindle, the work spindle, the coolant pump and the optional oscillation equipment.

No belts.

The control panel includes a step switch for the motors and a main switch for emergy shutdown.

The main switch is fitted with undervoltage release to avoid to avoid malfunction of the motors.

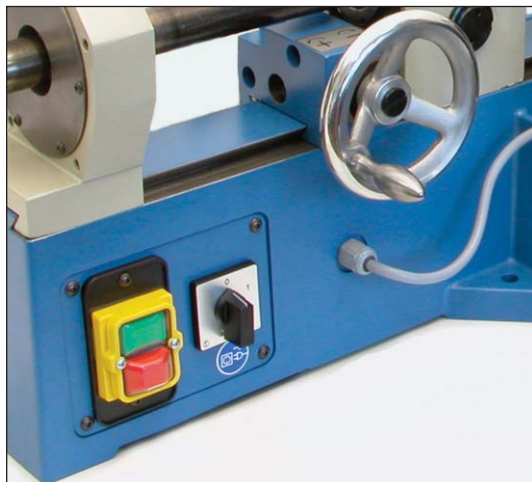
**VKM3.4 Valve Grinding Machine
for Valves with Stem Diameter from 9 to 40 mm.**



The
COMPACT MACHINE
with Large Chucking Capacity.

Featuring the unique Hunger combination
of SELF-CENTERING STEADYING and COLLET CHUCKING
to ensure the ultimate in valve refacing accuracy.

Tested and specified by leading engine manufacturers.



Specifications:

Capacity:

Valve stem diameter range 9 - 40 mm

Max. valve face diam. 200 mm

Valve angle range 18° - 47°

Grinding Spindle:

Grinding Wheel Diameter 175 mm

Speed 2790 rpm

Work Spindle:

Speed, Standard 35 rpm

Coolant System:

Capacity 5 l

Electrics:

Supply voltage 400V±10%
(3-phase, 50/60Hz) or 230V±10%

Power consumption 0,6 kW

Overall Dimensions:

Length 800 mm

Width 550 mm

Height 600 mm

Weight:

Net weight ca. 120 kg

Machine Base.

Heavily ribbed cast iron structure with integrated dove tailed slideway for the workhead and steady rest.

The machine base houses an industrial type flood pump for delivering coolant to the grinding site and a baffled drawer type coolant reservoir which can be drawn out for ease of cleaning.

The machine base houses also the control panel for the motors.

Grinding Spindle.

The permanently sealed and lubricated grinding spindle slides on a swivel plate which is provided with an integrated dove tailed slideway.

The swivel plate is set to the desired valve angle by means of a wide spaced scale.

Wheel Dressing Attachment.

The dressing attachment is permanently mounted on the machine base for rapid wheel dressing.

Workhead and Steady Rest.

The monobloc workhead houses the permanently sealed and lubricated work spindle provided with a collet chuck for use of high precision collets.

The workhead and an unique selfcentering steady rest for additional support of long stem valves are placed on an the slideway provided at the machine base.

Both the workhead and the steady rest are adjustable along the slideway to clamp each valve on that part of the valve stem which normally travels in the valve guide.

The combination of collet chucking and the unique Hunger steadying provides double support of long valves to ensure the ultimate in valve refacing accuracy.

A micrometer infeed unit is provided at the slideway on the machine base to feed the face of the valve clamped in the collet to the grinding wheel.

Electrics.

An individual motor is provided for each of the grinding spindle, the work spindle, the coolant pump and the optional oscillation equipment.

No belts.

The control panel includes a step switch for the motors and a main switch for emergy shutdown.

The main switch is fitted with undervoltage release to avoid to avoid malfunction of the motors.

**VKM4A Valve Grinding Machine
for Valves with Stem Diameter from 9 to 40 mm.**



**If you are looking for
HEAVY-DUTY and HIGH PRECISION
this is simply your machine.**

Featuring the unique Hunger combination
of SELF-CENTERING STEADYING and COLLET CHUCKING
to ensure the ultimate in valve refacing accuracy.

Tested and specified by leading engine manufacturers.

Standard Features.

Machine Base.

Heavily ribbed cast iron structure for vibration free performance.

The machine base houses an industrial type flood pump for delivering coolant to the grinding site and a baffled coolant tank which can be drawn out for ease of cleaning.

Wheel Head.

Box type monobloc casting noted for its excellent vibration damping characteristics.

The precision grinding spindle is permanently sealed and lubricated for lifetime accuracy.

The powerful spindle drive motor in combination with the 250 mm diameter grinding wheel allows fast stock removal.

The wheel guarding system is designed to the prevailing safety regulations.

Workhead.

Cast iron monobloc for vibration free performance.

Rigid support of the work spindle on precision bearings.

The work spindle is fitted with a collet chuck for use of high precision collets. The variable speed work spindle drive unit is mounted on top of the workhead.

Swivel Plate

The workhead rests on an elongated swivel plate mounted on the work table.

The swivel plate can be set to the required angular position by means of a widely spaced scale.

Index stops with micrometer adjustment are provided at 30° and 45° positions.

The swivel plate has a dovetailed slideway allowing the workhead and a selfcentering steady to be adjusted along the swivel plate to chuck and steady the valve at that part of the valve stem which normally travels in the valve guide.

Work Table.

The infeed slide on top of the work table is guided by a dovetailed slideway provided with an adjustable strip for long term accuracy.

The worktable itself is guided on slide bars to ensure smooth traversing of the valve face across the grinding wheel.

Dressing Attachment.

The dressing attachment is housed in the wheelhead for rapid wheel dressing, also during grinding with the valve chucked in the work spindle.

An individual handwheel is provided for traversing the diamond along the grinding wheel.

Optional Features.

Selfcentering Steady.

A selfcentering steady is available to fit on the swivel plate slideway for additional support of long stem valves.

The combination of collet chucking and the unique Hunger steadying provides double support of long valves to ensure the ultimate in valve refacing accuracy.

Oscillating Equipment

An oscillating equipment for automated power traverse of valve face across the grinding wheel is available to ensure efficient stock removal and superior finish.

The stroke of oscillation is infinitely adjustable.

Automated Infeed

When grinding with automated infeed, the following grinding cycle is automatically performed.

1. Grinding of the valve with preselected infeed rate until a preselected total amount of infeed has been achieved.
2. Sparking out of the grinding wheel for a preselected period.
3. Removing the valve from the grinding wheel.

Specifications.

Capacity:

Valve stem diameter range	9 - 40 mm
Max. valve head diameter	320 mm
Grinding angle range	0° - 90°

Grinding spindle:

Max. wheel diameter	250 mm
Speed at 50 Hz	2800 rpm

Work spindle:

Speed range.	5 - 50 rpm
--------------	------------

Electrics:

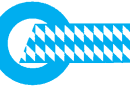
Supply voltage, standard	400V±10%
(3ph. 50/60Hz) option	230V±10%
Power consumption	2 kW

Overall dimensions:

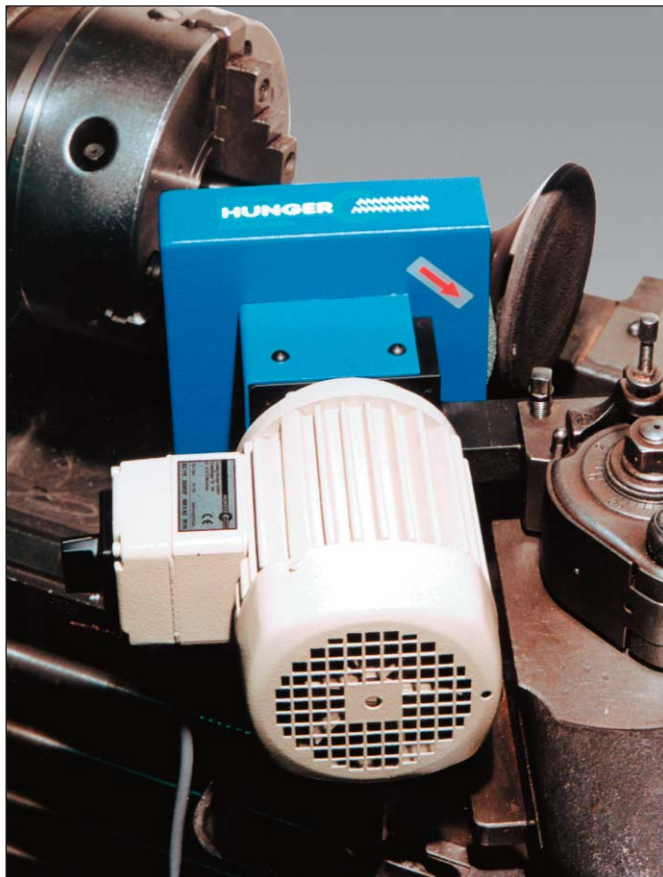
Width	1550 mm
Depth	900 mm
Height	950 mm

Weight:

Net weight	ca. 300 kg
------------	------------



SG175 Support Grinder for Grinding Valves on a Lathe.



Application.

The SG175 support grinder is designed for grinding the conical seating surface of valves of medium speed diesel engines on a standard lathe.

Handling.

The support grinder is clamped in the toolpost located on the top slide of the lathe.

The grinding angle corresponding to the required valve seat angle is adjusted by turning the top slide of the lathe to an angular position which corresponds to the valve seat angle and which is defined by the template supplied with the grinder.

The valve stem is clamped in the chuck of the lathe and the valve face is ground by feeding the grinding wheel into the rotating valve face.

Features.

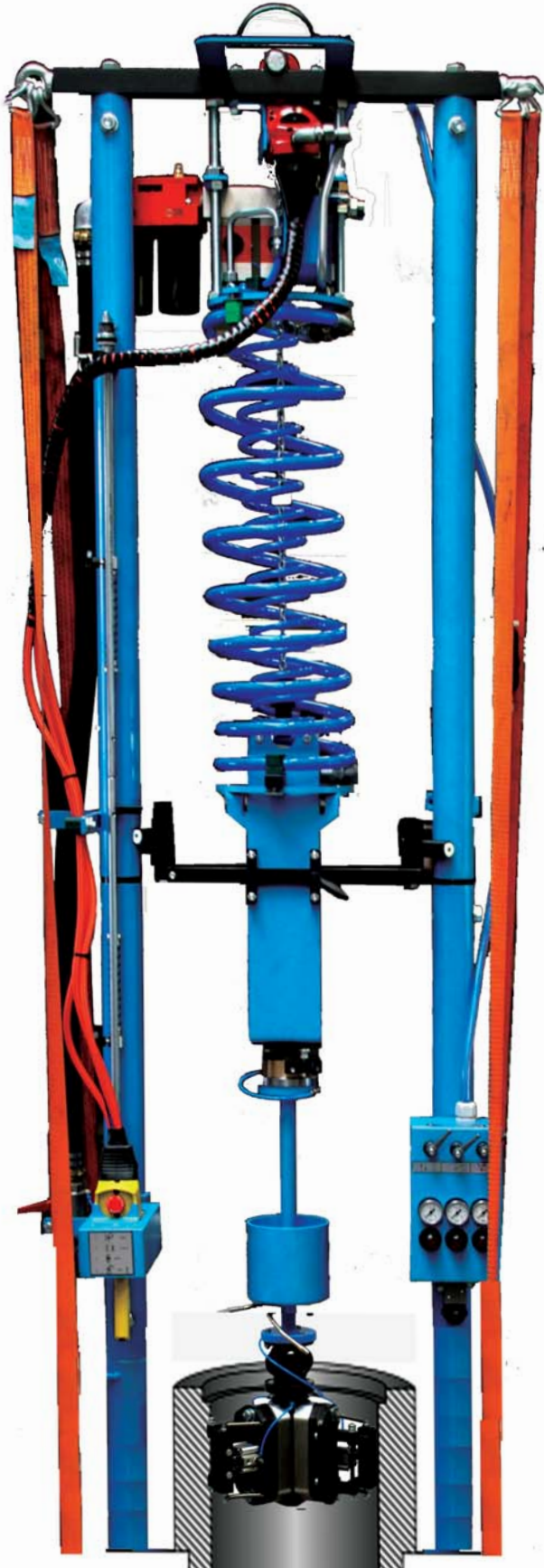
The precision grinding spindle is permanently sealed and lubricated for lifetime accuracy.

The wheel guarding system is designed to the prevailing safety regulations.

The cone-shaped head of the template is provided with a bore receiving the dressing diamond so that the grinding wheel can be properly dressed after adjustment of the grinding angle.

The switch for the grinding spindle drive motor is integrated in the terminal box of the motor.

PHM Mobile Honing Machine for Cylinder Liners from 150 to 640 mm Diameter.



The Key Features

- ★ **FULLY AIR POWERED.**
Powerfull air motor for rotary motion of honing head, an air hoist for stroke motion and, as an unique feature, air operated actuators for honing stone to cylinder wall pressure.
- ★ **STURDY HONING HEADS.**
Only three honing heads are required for cylinder liner bores from 150 to 640 mm diam.
Head type 150-250 mm for honing diam. 150-250 mm.
Head type 240-340 mm for honing diam. 240-340 mm.
Head type 320-640 mm for honing diam. 320-640 mm.
Each honing head can be easily set to the required honing diameter by inserting spacers between the central shaft and the stone holder units.
- ★ **PIVOT-MOUNTED STONE HOLDERS.**
The stone holders are pivot-mounted and radially offset to assure a wiping-type honing stone to cylinder wall contact for superior honing performance. ^
- ★ **AUTOMATIC STROKING.**
Automatic stroking of the honing head is a standard feature for ease of operation..
The honing stroke is adjustable by means of end stops which are slideably mounted on a control rod.
- ★ **COMFORT CONTROL PANEL.**
The comfort control panel is located near to the cylinder liner level for easy access.
The comfort control panel houses
the control knobs for fine adjusting of honing head RPM, the stroking rate and the stone feed pressure
the pressure gauges displaying the selected setting of the honing head RPM, the stroking rate and the stone feed pressure and
the levers for shutting-off the air supply to the air hoist, the air motor for the rotation of the honing head and the actuators for forcing the honing stones against inner wall of the cylinder liner.
- ★ **PREASSEMBLED DRIVE UNIT.**
The drive unit including the air hoist for stroking, the air motor for rotating the honing head and the comfort control panel are completely assembled in the factory and stored in the transport case so that only a short setup time is required for preparing the machine for honing a cylinder liner in the engine block.



PHM340
placed on HMB340 honing rig for honing
liners removed from engine block.

Description

The PHM is a sturdy and solid mobile machine protected by a strongly adhering color layer.

Two models are available.

PHM640 for liners up to 640mm in diameter and

PHM340 for liners up to 340mm in diameter.

Rotary motion and linear stroke motion of the honing head are in-finitely variable through simple pressure regulation of the air supply to obtain the desired crosshatch surface pattern. Stone feed pressure is also infinitely variable through regulation of air supply to the stone feeding actuators.

When air supply to the stone feeding actuators is shut off, the spring biased stone holders are pivoting inwards so that vertical scratches in the cylinder liner wall can be avoided when the honing head is inserted into or removed from the cylinder liner bore.

The powerfull air motor permits adjustment of the rotation speed of the honing head within a broad range by the mere turn of a control knob without changing any gear boxes.

The central control panel is equipped with regulator valves combined with manometer gauges for selecting the RPM of the honing head, the stroking rate and the stone contact pressure. Thus, the pressure settings which once proved as resulting in perfect surface finish, can be repeated time and again.

Automatic stroking is a standard feature.

The stroking lenght can be infinitely adjusted by means of end stops.

A single central air treatment unit with air filter and lubricator is also provided for trouble free operation.

An optional comfort control panel including the regulator valves and the manometer gauges can be provided at the lower end of the pre-assembled drive unit within easy reach of the operator while standing at cylinder liner level.

Setting up the PHM for honing requires only three steps.

1. Slide mounting tubes over two opposite studs at the engine block.
2. Placing the preassembled drive unit onto the mounting tubes.
3. Attaching the honing head to the air motor of the drive unit.

Specifications

Capacity:	PHM340	PHM640
Honing diameter range	150 - 340 mm	150- 640 mm

Feed motions:	
Honing head RPM range	20 - 70 rpm
Stroke speed	up to 19 m/min

Air supply:	
Air supply pressure	6 - 10 bar
Air consumption	up to 3,7 m ³ /min

Storage case:		
Length/Width/Height	1700/850/630mm	1700/910/630mm
Gross weight	ca. 250 kg	ca.300 kg

HMB Honing Rigs for the Mobile PHM Honing Machines



Application.

The HMB Honing Rigs are designed for use in a workshop or engine room to act as a stationary machine base for the mobile PHM Honing Machines to hone cylinder liners removed from the engine. HMB 640 rig is tailored to Honing Machine PHM 640. HMB 340 rig is tailored to Honing Machine PHM 340.

Features.

Rigid base structure including a pair of upright tubes acting as support for the mobile Honing Machine.

The cylinder liner to be honed is placed on a drawer-type honing liquid reservoir which is slideably mounted on the base structure so that it can be drawn out for loading and unloading the cylinder liner with an overhead crane.

An electric pump is provided at the honing liquid reservoir to supply honing liquid to a spray nozzle which can be attached to the upright frame tubes at the appropriate position by means of a magnetic base.

Settlement compartments are provided in the honing liquid reservoir to precipitate the abrasive honing sludge so that clean honing liquid will be supplied to the honing site.

Specifications.

	Type HMB 340	Type HMB 640
For use with		
Mobile honing machine	PHM 340	PHM 640
Honing liquid reservoir.		
Capacity	50 liters	190 liters
Electrical supply.		
Standard supply voltage	400 V±10%, 3ph, 50/60 Hz	
Power consumption	0,5 kW	
Overall dimensions.		
Width	700 mm	1180 mm
Depth	950 mm	1350 mm
Height	1000 mm	1720 mm
Weight:		
Net weight	180 kg	500 kg

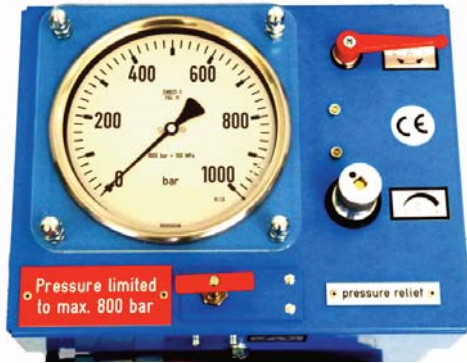


HMB 640



HMB 340

NTS Fuel Injector Test Stand



Application.

The NTS is designed for testing the fuel injectors of large diesel engines.

Use NTS for judging the shape and atomisation of the injection stream and for leak testing of the needle seating.

If required, the injector can also be serviced and adjusted while clamped to the NTS.

Features.

The pressure of the testing liquid is generated by means of an double acting high pressure pump which is powered by standard pressurized air.

The pressure of the testing liquid is infinitely adjustable up to 800 bar.

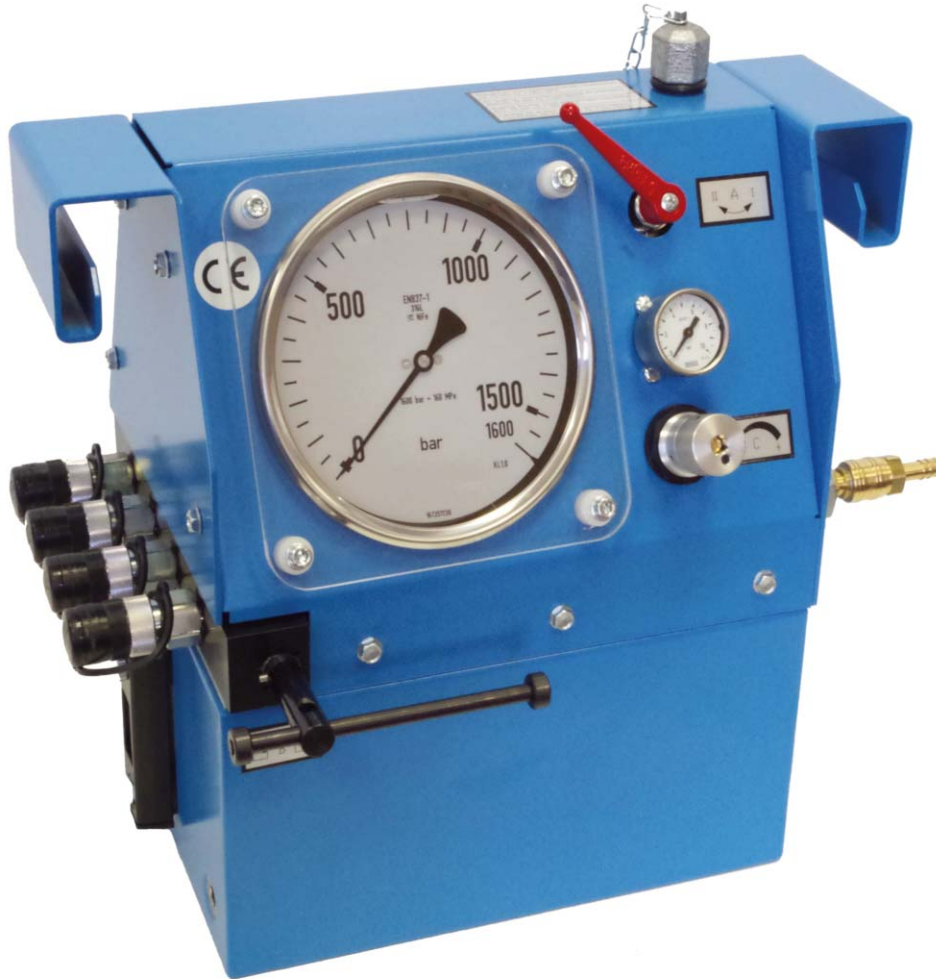
The rigid injector clamping assembly is pivotally mounted so that the clamped injector can be positioned horizontally for ease of servicing and adjusting.

The container for collecting the testing liquid is provided with an outlet for removing the liquid by suction.

Specifications.

Max. Testing Pressure	800 bar
Air Supply	
Max. Operating Pressure	15 bar
Air Consumption	0,5 - 1,5 m ³ /min
Testing liquid reservoir	
Capacity	10 liters
Overall Dimensions	
Length	600 mm
Width	500 mm
Height	1200 mm
Weight	ca. 100 kg

**HD1500 High Pressure Hydraulic Power Pack
for Hydraulic Pressures up to 1500 bar.**



Application.

The HD1500 is designed for delivering high hydraulic pressure up to 1500 bar required for operating hydraulic tools, especially hydraulic tools for loosening and tightening the clamping screws provided at large diesel engines.

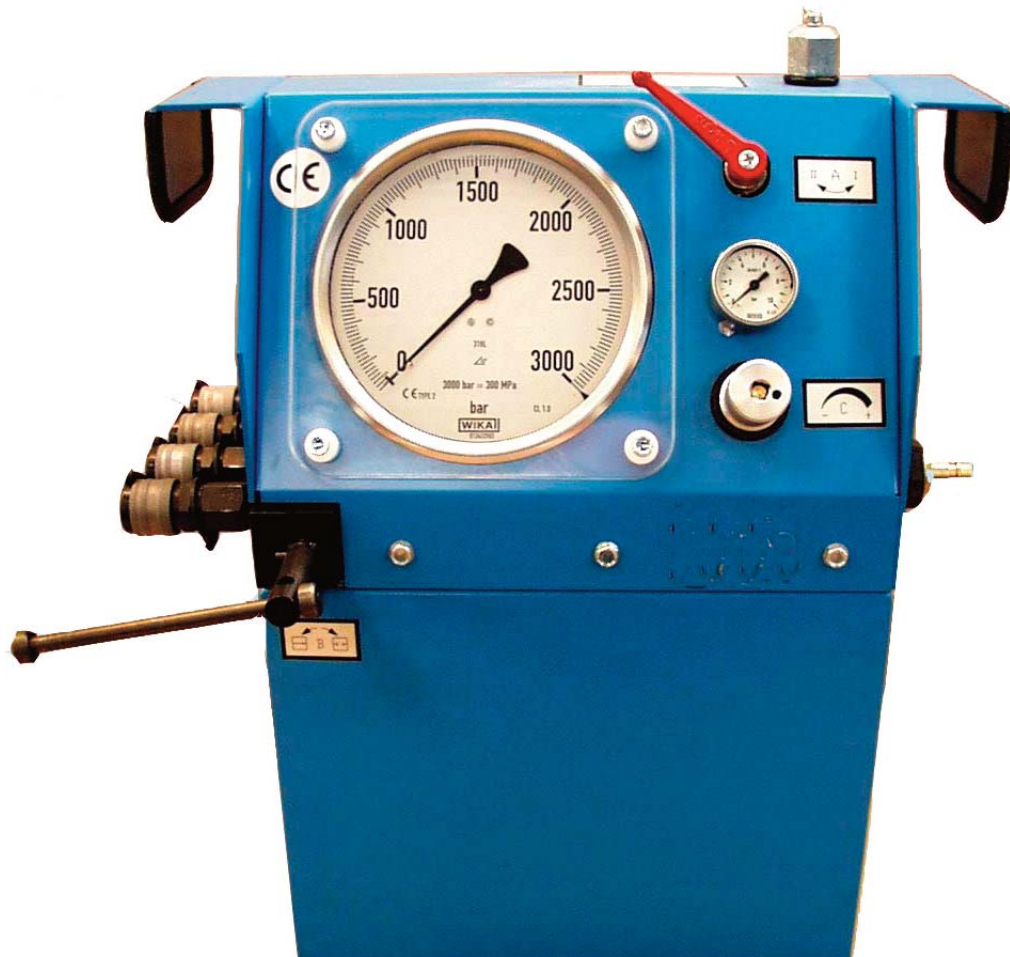
Features.

The HD1500 is powered exclusively by air. Up to four hydraulic tools can be connected to the HD1500. The HD1500 includes burst protection and a relief pressure valve.

Specifications.

Minimum air supply pressure	6 bar
Maximum air supply pressure.	15 bar
Maximum hydraulic pressure	1500 bar
Hydraulic liquid capacity	10 liters
Air inlet	Ø 9mm
Hydraulic liquid outlets	4 x CEJN Series 116
Overall Dimensions:	
Length	430mm
Width	315mm
Height	415mm
Weight	
Empty	24 kg
Filled	32 kg

HD2500 High Pressure Hydraulic Power Pack for Hydraulic Pressures up to 2500 bar.



Application.

The HD2500 is designed for delivering high hydraulic pressure up to 2500 bar required for operating hydraulic devices, especially hydraulic tools for loosening and tightening the clamping screws provided at large diesel engines.

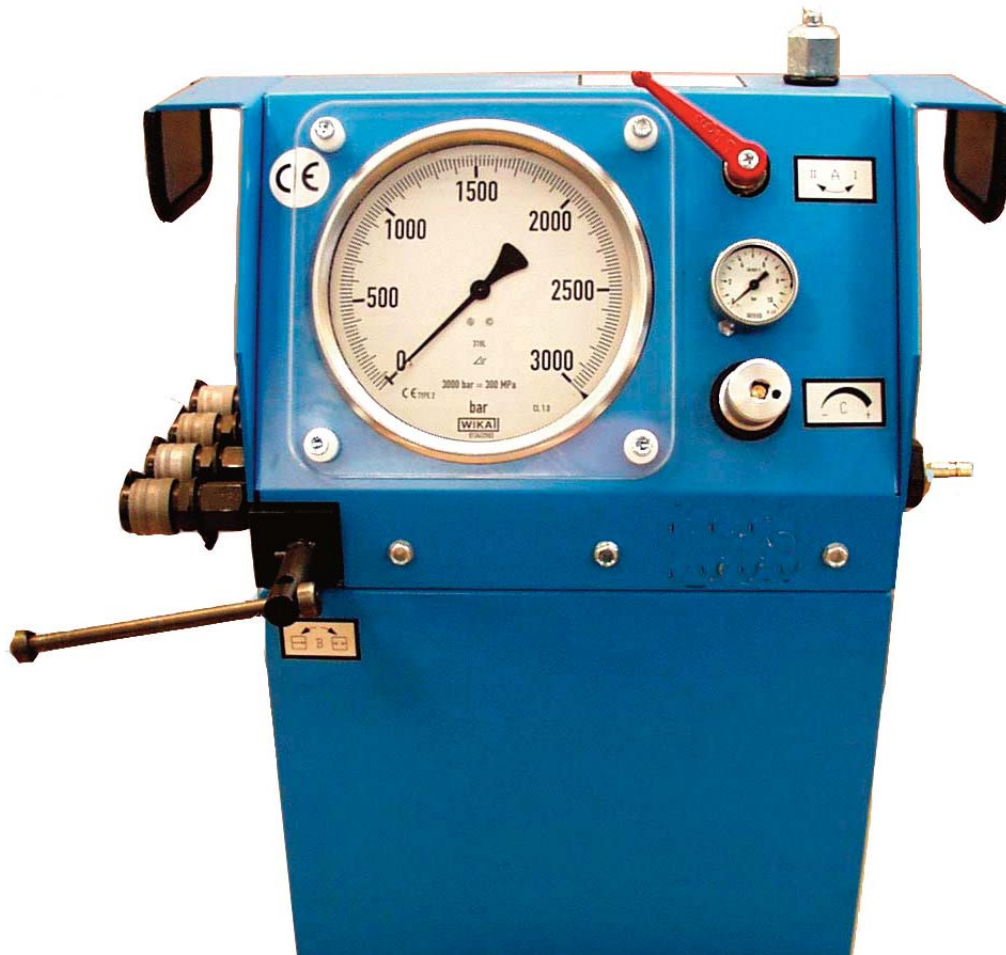
Features.

The HD2500 is powered exclusively by air. Up to four hydraulic tools can be connected to the HD2500. The HD2500 includes burst protection and a relief pressure valve.

Specifications.

Minimum air supply pressure	6 bar
Maximum air supply pressure.	15 bar
Maximum hydraulic pressure	2500 bar
Hydraulic liquid capacity	10 liters
Air inlet	Ø 9mm
Hydraulic liquid outlet	4x CEJN Series 125
Overall Dimensions:	
Length	431 mm
Width	315 mm
Height	550 mm
Weight	
Empty	ca. 30 kg
Filled	ca. 40 kg

HD3000 High Pressure Hydraulic Power Pack for Hydraulic Pressures up to 3000 bar.



Application:

The HD3000 is designed for delivering high hydraulic pressure up to 3000 bar required for operating hydraulic devices, especially hydraulic tools for loosening and tightening the clamping screws provided at large diesel engines.

Features:

The HD3000 is powered exclusively by air. Up to four hydraulic tools can be connected to the HD3000. The HD3000 includes burst protection and a relief pressure valve.

Specifications:

Minimum air supply pressure	6 bar
Maximum air supply pressure.	15 bar
Maximum hydraulic pressure	3000 bar
Hydraulic liquid capacity	10 liters
Air inlet	Ø 9mm
Hydraulic liquid outlet	4x CEJN Series 125
Overall Dimensions:	
Length	431 mm
Width	315 mm
Height	550 mm
Weight	
Empty	ca. 30 kg
Filled	ca. 40 kg